THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 34 JANUARY, 1934 No. 4

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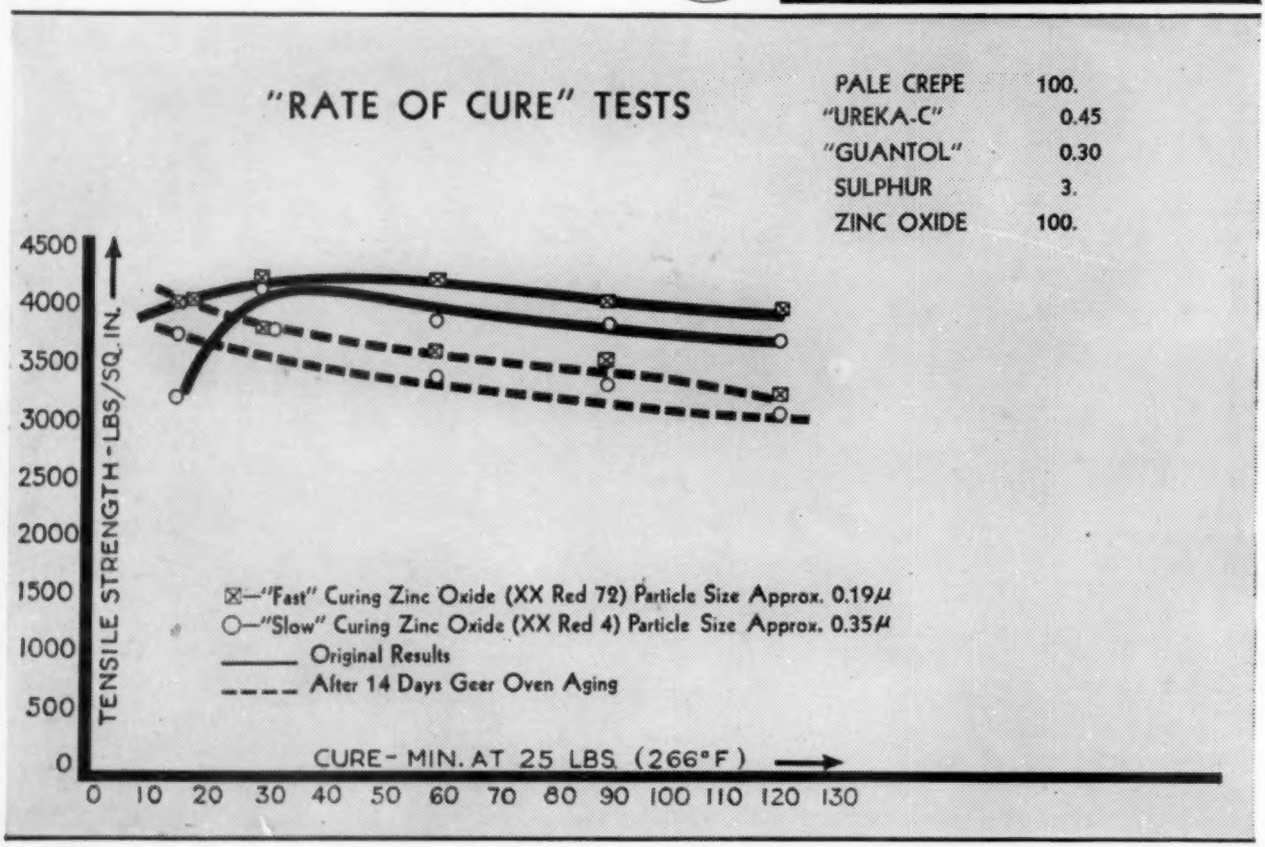

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RUBBER THREAD

An Outline of the Manufacturing Processes Used in the Production of Rubber Thread and the Performance of Different Types

By DANIEL RHEE
Consulting Chemist, Bristol, R. I.

RUBBER thread manufacture today is being attempted by several processes. The first of these methods is the one commonly used in America and is being introduced in continental Europe. It consists of milling the raw rubber and other ingredients on mixing mills, sheeting the mixture through the calender, vulcanizing it in various ways, and cutting it on special machines.

The second process is similar to the first except that the unvulcanized rubber instead of being masticated on mills, and run through the calender, is dissolved in solvent or solvents, spread into a sheet by a spreading machine. Vulcanizing and cutting are carried out in the usual manner. This system is still very widely employed in Europe although it is gradually being replaced by the American method.

The third process is that of using rubber latex, and there have been innumerable schemes devised during the last few years. The most important of these is the extrusion method by which the latex is allowed to flow through a spinnerette or capillary tube which is submerged in a coagulating bath. The coagulated latex is then dried and vulcanized or in the case of latex covered by the Schidrowitz patents, it makes any subsequent vulcanization unnecessary. This process has an advantage in producing extremely fine sizes of rubber thread that are beyond limitations of modern thread cutting machinery. The Fritz Cremer fountain method which uses an ordinary drawing pen to lay out a thin tape on a moving band can be classified under this heading for practical purposes.

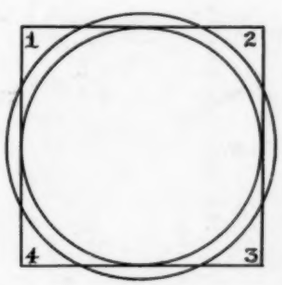


Figure 3

There is still another method in using latex in order to obtain rubber thread, and this is accomplished by building up a sheet by dipping into the latex either a moving belt or a revolving cylinder. The sheet so prepared is vulcanized and cut. Of course, it is of interest to note that in the case of cylindrical sheet it is cut in helix form so as to obtain a continuous thread.

From the standpoint of rubber thread, rubber can be divided into three groups:

1. Wild Para Rubber
2. Plantation Rubber
3. Latex Rubber

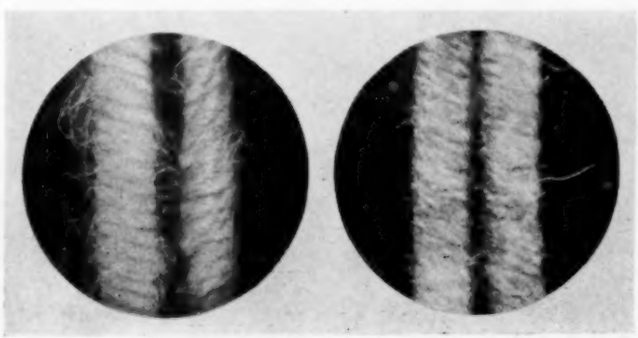


Figure 1

Figure 2

Effect of Oxygen Aging

Without the aid of antioxidants and accelerators plantation rubber and latex would have been relatively unimportant in thread manufacture. Before the advent of anti-

oxidants, a good thread made from Para or wild rubber would last about 72 hours in the oxygen bomb while plantation rubber and latex rubber (the evaporated), with the best possible approach to the wild rubber characteristics, would last only 24 hours. In actual webbing and naturally aging, this difference was still pronounced. When antioxidants were brought into notice, conditions improved so that the resistance to oxidation was increased many-fold. Nevertheless, Para rubber has retained its superiority over the others under the same conditions. Plantation rubber and latex had to sacrifice elongation or "stretch"

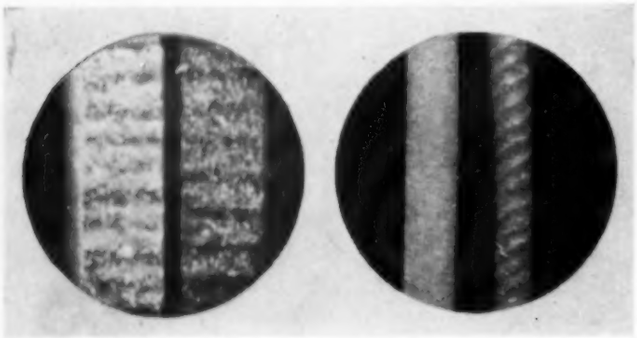


Figure 4 Figure 5

in order to emulate Para for its excellent modulus or "kick". In doing so, the resistance toward action of light and fatigue was impaired. Hence, it is obvious that the discovery of the antioxidants and accelerators has made the use of these latter two types of rubber in thread manufacture possible.

Then came the application of accelerators whose primary function is to shorten the time and lower the temperature of vulcanization. This led to a longer aging thread for all rubbers, and the use of accelerators together with antioxidants made it possible for all rubber better to withstand the abuse, such as washing, heating, etc., and even extravagant claims were made in some instances.

It has been a desire of webbing manufacturers to obtain a white and other colored rubbers, which were possible, but not without sacrifice. It meant use of coloring pigments or agents along with the accelerators and, as a consequence, all standards of manufacture were virtually overthrown, namely the loss of stretch—a production of an entirely different rubber thread with new physical properties. In spite of all this, however, the rubber thread so made had a tendency to fatigue rapidly while Para thread continued to out-stretch, out-live and out-kick and become fatigued less quickly, although its application in

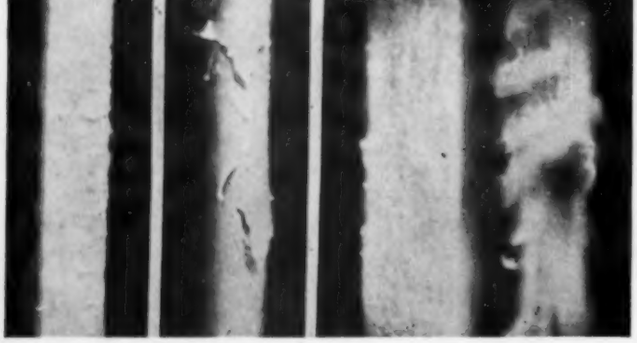


Fig. 6 Fig. 7 Fig. 8

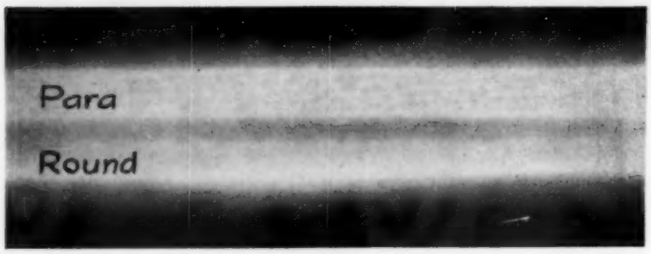


Figure 9

the field of light and brilliant colored thread was much limited due to its natural dark color.

But the happy combination of accelerators and antioxidants in conjunction with colored pigments produced a rubber thread that, when aged in the oxygen bomb, lasted over one thousand hours in many cases. This compared to the ancient standard of 24 hours to 72 hours was naturally revolutionary, especially when color was obtained in additions. With these advantages, in spite of sacrifices, Para rubber began to take, at least temporarily, a subordinate place in the world of thread manufacture because of its lack of ability to meet color, although the wild rubber thread under similar conditions as above would outlast the others by a wide margin.

Geometric Forms

Since the introduction of extruded rubber thread, geometry was added to color and still more claims began to be made as to the superiority of one form over another, such as square, triangular, or round cross section, but the fundamental differences between the various types of rubber still exist as pointed out above. The chief shortcoming of the plantation and latex rubber has been less "kick", shorter stretch and rapid fatigue. And, in order to overcome these evils, the manufacturers adopted the idea of lubrication to reduce friction and "work" during webbing to its minimum. This was only possible, however, where anchorage for yarn was certain, and where rubber, whether wild, plantation, or latex was so made as to surely grip the yarn. Figures 1 and 2 show how this anchorage is very essential, as the yarn is wound around the rubber. Although one of these rubbers is round and the other square in their cross sections, they cannot be differentiated by mere appearance, as both are ultimately

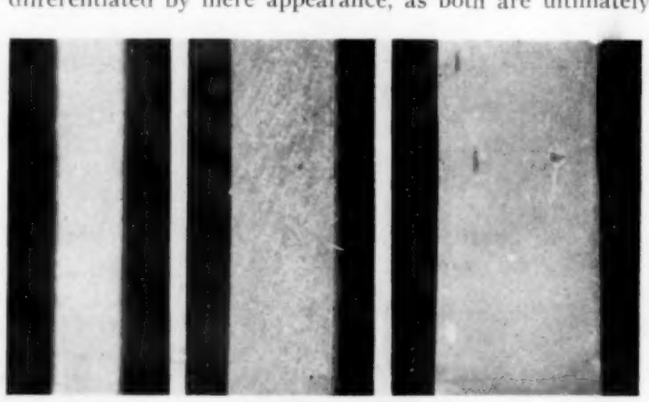


Fig. 10 Fig. 11 Fig. 12

round yarns. The same picture might have been made of rubber thread whose cross section might be somewhat rectangular, elliptical, or triangular. It has been pointed out by the webbing manufacturers that a rubber thread with corners, such as square or triangular, helps anchor the yarn around the rubber, and this idea is very well illustrated in Figure 3.

(Continued on page 176)

Code of Fair Competition for the Rubber Tire Manufacturing Industry

[Effective as of December 25, 1933]

TO EFFECT the policies of Title I of the National Industrial Recovery Act, this Code is submitted as a Code of Fair Competition for the Rubber Tire Manufacturing Industry, and upon approval by the President, its provisions shall be the standards of fair competition for this Industry, and shall be binding upon every member thereof.

ARTICLE I

A. Definitions

Section 1. The term "Rubber Tire Manufacturing Industry" or "Industry," as used herein, shall mean the manufacture for sale in the continental United States (including Alaska) and sale at wholesale by manufacturers or subsidiaries or affiliates of the same, of solid or pneumatic rubber tires and/or pneumatic rubber tubes together with such related branches or divisions as may from time to time be included under the provisions of this Code by the President, after such notice and hearing as he may prescribe.

Section 2. The term "member of the Industry" or "member" as used herein includes, but without limitation, any individual, partnership, association or corporation or other form of enterprise, engaged in the manufacture or both manufacture and sale at wholesale of any products of the Industry, or any subsidiary or affiliate of the same engaged in the sale at wholesale of any products of the Industry.

Section 3. The term "member of the Code" as used herein, includes any member of the Industry who shall expressly signify assent to this Code.

Section 4. The term "employee" as used herein includes any and all persons engaged in the Industry, however compensated, except a member of the Industry.

Section 5. The term "Association" as used herein, shall mean the Rubber Manufacturers Association, Incorporated, a corporation organized under the laws of the State of Connecticut and having its principal office at 250 West 57th Street, New York, New York.

Section 6. The term "dealer" as used herein, shall mean anyone, whether or not a member has a financial interest therein, who purchases a member's brand of tires and/or tubes, from a member or jobber, under contract for sale, either absolute, conditional or on consignment, and who in turn resells to other than employees or affiliated companies, at least 75% of the tires or tubes so purchased. Company retail stores whether wholly or partly owned, shall be classified as dealers.

Section 7. The term "jobber" as used herein, shall mean anyone who sells at least 75% of his total volume of tires and/or tubes through or to dealers for resale to consumers, whether or not such dealers are owned or affiliated with or controlled by such jobber, and who performs the services of a jobber such as maintaining a stock, selling, shipping, billing and carrying accounts receivable.

Section 8. The term "warehouse dealer" as used herein, shall mean a dealer who acts as a shipping agent for a member of the Industry with sales, credits and collections handled by that member.

Section 9. The term "the President" as used herein, shall mean the President of the United States.

Section 10. The term "the administrator" as used herein, shall mean the Administrator appointed under Title I of the National Industrial Recovery Act.

Section 11. The term "the Act," as used herein, shall mean the National Industrial Recovery Act.

Section 12. Population for the purposes of this Code shall be determined by reference to the latest Federal Census.

ARTICLE II

A. Administration and Organization

Section 1. To further effectuate the policies of the Act, a Tire Code Authority (herein referred to as the Code Authority) is hereby set up for the administration of this Code.

General Johnson Says That No Industry Can Derive More Benefit from the NRA

"...No other Industry can derive greater benefits from the Act. This code in no sense embodies a complete solution of all the problems of the Industry. It does represent a real beginning. The reclamation of this Industry from the destructive competition which exists must be a continuing task over a long period of time."

—General Johnson, in his letter to President Roosevelt, transmitting the Tire Code.

Section 2. The Code Authority shall consist of eight persons who shall be selected by the Industry by a fair method of selection, according to such rules as it may determine. The Administrator, in his discretion, may appoint not more than three additional members, without vote, to represent the Administrator, without expense to the Industry or Association. No two of the members of the Code Authority or their alternates shall be affiliated with any single member of the Industry.

(a) In order that the Code Authority shall at all times be truly representative of the Industry and in other respects comply with the provisions of the Act, the Administrator may provide such hearings as he may deem proper; and if thereafter he shall find that the Code Authority is not truly representative or does not in other respects comply with the provisions of the Act, he may require modification in the method of selection of the Code Authority.

(b) The President of the Association and its General Manager shall act as ex-officio members of the Code Authority with no voting power. The General Manager of the Association shall act as Chairman of the Code Authority.

(c) One alternate shall be selected for each member of the Code Authority, with full power to vote in the absence of his principal. Provided that no two alternates shall be affiliated with any single member of the Industry.

(d) Should any matter come before the Code Authority which specifically involves acts, conduct, or the interest of a member of the Industry with which any member of the Code Authority is associated or employed, such member of the Code Authority shall be disqualified to act in such matter. The designated alternate shall act in place of the disqualified member of the Code Authority.

(e) Meetings shall be called by the Chairman either at his discretion, or on the suggestion of any three members of the Code Authority. The Code Authority shall determine its own rules of procedure.

Section 3. The Code Authority shall have the duties and powers herein provided, subject to the right of the Administrator, on review to disapprove any action taken by the Code Authority.

(a) The Code Authority shall make investigations as to the functioning and observance of any provisions of this Code at its own instance, or on complaint by any person affected, and report its findings and recommendations to the Administrator.

(b) The Code Authority shall study the trade practice provisions incorporated in this Code, and the operation thereof and shall make such recommendations to the Administrator from time to time which it considers desirable, for modification or addition thereto, provided such recommendations shall have been approved by members of the Code as provided in Article X. Upon approval by the Administrator, after such hearing as he may prescribe, such recommendations shall become a part of this Code and have full force and effect as provisions hereof.

(c) The Code Authority may at its discretion present recommendations to the Administrator, based on conditions in the Industry, as they may develop from time to time, provided such recommendations shall have been approved by members of the Code as provided in Article X. Such recommendations shall be designed to facilitate the operation of the provisions of this Code and the policy of the Act.

(d) The Code Authority may require reports from members of the Industry in respect to hours of labor, wages, conditions of employment, number of employees, plant capacity, production, orders, shipments, inventories and any other matters pertinent to this Code in order that the President may be kept informed with respect to the observance and performance of the Code.

(e) The Code Authority may, at its discretion set up any or all of the following committees or any other committees, if their existence will further effectuate the policies of the Act, viz.:

Accounting — Fair Practices
Complaints and Grievances — Industrial Relations
Statistical

(f) The Code Authority may set up a committee on imports whose duty it shall be to investigate and inform the President as to the importation of competitive articles into the United States in substantial quantities or increasing ratio to domestic production, on such terms or under such conditions as to render ineffective, or to seriously endanger the maintenance of this Code as provided in Section 3 (e) of the Act. The Committee shall make such reports of its findings to the Code Authority who shall inform the President through the proper channels.

Section 4. The Association is hereby designated as the agency for the collection of statistics, data, reports and information under the Code, provided that no inequitable restrictions upon membership therein shall at any time be imposed.

(a) Every member of the Industry shall prepare and file with the Association at such times and in such manner and form as the Code Authority may require, statistics of plant capacity, production, sales, orders received, inventories, wage rates, hours of work, and such other data or information as the Administrator may, from time to time, require. Such reports and/or records may be either sworn or unsworn as required.

(b) In addition to information required to be submitted to the Code Authority, every member of the Industry shall furnish directly to governmental agencies such statistical information as the Administrator may deem necessary for the purposes recited in Section 3 (a) of the Act.

(c) Except as otherwise provided in the Act, all such statistics, data and information filed in accordance with this Article shall be confidential, and the reports and records from any individual member of the Industry shall only be revealed to the Administrator or other governmental authority, to the extent necessary for the administration and enforcement of the provisions of this Code.

(d) If the Association shall have reason to believe that any reports submitted by a member are inaccurate, such reports may be verified by a disinterested and impartial agency designated by the Code Authority, and for such purpose, such agency shall have access to any and all relevant books and records of such member.

(e) Any refusal or persistent or deliberate neglect by any member of the Industry to file or furnish information required under this Article shall constitute an unfair trade practice and a violation of this Code.

Section 5. Each member of the Code shall be entitled to participate in the activities of the Association in connection with the administration of the Code. Any other member of the Industry may become entitled to participate by becoming a member of the Code. Each member of the Code shall bear an equitable share of the cost of maintenance of the Code Authority, either by becoming a member of the Association, or by paying to the Association a sum equal to its reasonable share of the expenses incurred in the administration of this Code, as determined by the Code Authority, subject to review by the Administrator.

ARTICLE III

A. Industrial Relations Policies

Section 1. In compliance with Section 7 (a) of the Act, it is provided:

(a) That employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

(b) That no employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing.

(c) That employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment approved or prescribed by the President.

Section 2. No person under 16 years of age shall be employed in the Industry. No person under 18 years of age shall be employed on any milling or calendering operations or any other operations where there may be recognized hazards connected with the job or operation.

Section 3. No provision in this Code shall supersede any law within any State which imposes more stringent requirements on employers as to age of employees, wages, hours of work, or as to safety, health, or sanitary conditions, or insurance, or fire protection, or general working conditions, than are imposed by this Code.

ARTICLE IV

A. Hours

Section 1. Except as provided in Section 2, no factory employee shall work or be permitted to work, in excess of an average of 36 hours in any one week, averaged over a calendar year, nor more than 8 hours in any 24 hour period. Provided that no such employee shall work or be permitted to work more than 42 hours in any one week. For all hours worked in excess of 36 hours per week, over-time shall be paid at the rate of time and one-third. It is the intent that the hours worked by employees under this Section shall be consecutive, except that reasonable provision may be made for eating periods.

Section 2. Maintenance crews, engineers, firemen, shipping crews and tire testers shall not work or be permitted to work in excess of 40 hours in any one week nor more than 8 hours in any 24 hour period. Provided, however, that this limitation of hours shall not apply in cases of emergency, but in such cases all hours worked in excess of 40 hours in any one week or 8 hours in any 24 hour period, shall be paid for at the rate of time and one-third.

(a) Watchmen shall not work or be permitted to work more than 84 hours in any two weeks' period, provided that such employees shall have one day off in seven.

Section 3. Accounting, clerical, office, service, sales or other employees (excepting outside salesmen) shall not work or be permitted to work in excess of an average of 40 hours a week over the period of a month, nor more than 48 hours in any one week.

Section 4. The maximum hours fixed in Sections 1, 2 and 3 shall not apply to salaried employees in any managerial, executive, clerical, supervisory or technical capacity receiving more than $35.00 per week, nor to any outside salesmen.

Section 5. No employee shall work or be permitted to work for a total number of hours in excess of the number of hours prescribed for each week and day, whether employed by one or more employers; provided, however, that if any employee works for more than one employer for a total number of hours in excess of such maximum without the knowledge or connivance of any one of his employers, such employer shall not be deemed to have violated this section.

Section 6. No employee shall be classified in any of the foregoing exempted classes unless he performs functions identical with those performed by employees thus classified on June 16, 1933.

B. Wages

Section 1. Except as herein provided, no employee shall be paid in any pay period less than at the rate of Forty Cents ($.40) per hour. Provided, however, that where the hourly rate for the same or similar class of work on July 15, 1929, was less than Forty Cents ($.40) per hour, no employee shall be paid at less than the rate per hour paid on July 15, 1929, but in no case shall the rate per hour be less than Thirty-Five Cents ($.35).

(a) Apprentices, during a six weeks' apprenticeship, may be paid not less than eighty per cent (80%) of the above specified minimum rates. Such apprentices shall be understood as persons having no previous experience or employment on similar work in the Industry and shall not constitute more than five (5) per cent of the total employees covered by this Section, in the employ of any member.

Section 2. No salaried employee (except outside salesmen, office girls and boys, and clerical apprentices) shall be paid less than at the rate of:

$15.00 per week—Cities over 500,000 population or in the immediate trade area of such city.
$14.50 per week—Cities between 250,000 and 500,000 population or in the immediate trade area of such a city.
$14.00 per week—Cities between 2,500 and under 250,000 population or in the immediate trade area of such a city.
$12.00 per week—Towns of less than 2,500 population.

(a) Clerical apprentices during a six months' apprenticeship and office boys and girls may be paid not less than 80% of the above minimums. Such excepted office employees shall not exceed 5% of the total number of employees covered by Section 2, in the employ of any member.

Section 3. The provisions in Article IV-B shall not apply to any employee partially incapacitated through age, injury or disease, provided, however, that such employee shall receive not less than $.25 per hour. Each member of the Industry shall report to the Association monthly the number and names of employees so classified.

Section 4. Female employees performing the same work as male employees in manufacturing operations shall receive the same rates of pay as male employees.

Section 5. Article IV-B establishes a minimum rate of pay which shall apply, whether an employee is actually compensated on a time rate, piecework, or other basis.

Section 6. Equitable adjustments in all pay schedules of factory employees above the minimum shall be made within thirty (30) days after the approval of this Code, by any members who have not heretofore made such adjustments, and the first monthly reports of wages required to be filed under this Code, shall contain full information as to all wage increases made since May 1st, 1933.

C. Posting of Labor Provisions

Section 1. Every member of the Industry shall post in conspicuous places in all departments of his establishment or establishments, copies of Articles III and IV of this Code.

ARTICLE V

A. Cost and Market Stabilization

Section 1. The Code Authority shall immediately upon approval of this Code proceed to a study of a market stabilization plan based on cost control.

(a) A standard uniform system of accounting, for the guidance of each member of the Industry shall be developed, under the direction of the Code Authority.

(b) The Code Authority shall designate, with the approval of the Administrator, a disinterested and impartial agency, to procure and compile the data required to complete the study and to act as the agency through which such compiled data shall be transmitted to the Code Authority, in order that all cost data of members of the Industry shall be kept confidential. Each member of the Industry shall furnish such agency with such reports as may be designated by the Code Authority.

(c) The Code Authority shall confer with the Administrator from time to time in the course of formulating its recommendations as to the plan for such market stabilization herein above proposed. The Code Authority shall make an initial report concerning progress in the formulation of such a plan within thirty (30) days after the approval of this Code. Final recommendation shall be submitted to the Administrator within sixty (60) days from date of approval of this Code.

Section 2. After such market stabilization plan based on cost control shall have received approval by the Industry and by the Administrator, such plan shall become a part of this Code. Violation of any provision of such plan shall be considered an unfair trade practice and subject to the penalties of the Act.

ARTICLE VI

A. Trade Practices

Section 1. No member shall use advertising (whether printed, radio, display or of any other nature) or other representation which is inaccurate in any material particular or which refers inaccurately to competitors or their commodities, prices, values, credit terms, policies or services. No member shall, in any way, misrepresent any commodity (including its use, trade mark, grade, quality, quantity, origin, size, specifications) or his credit terms, values, policies, services, or the nature or form of the business conducted.

Section 2. No member shall use advertising or selling methods or credit terms which tend to deceive or mislead a customer or prospective customer.

Section 3. No member shall publish or circularize unjustified or unwarranted threats of legal proceedings which tend to or have the effect of harassing competitors or intimidating their customers.

Section 4. No member shall secretly offer or make any payment or allowance of a rebate, refund, commission, credit, unearned discount or excess allowance, whether in the form of money or otherwise, for the purpose of influencing a sale; nor shall a member secretly extend to any customer any special service or privilege not extended to all customers of the same class.

Section 5. No member shall give, permit to be given, or offer to give anything of value for the purpose of influencing or rewarding the action of any employee or agent of another, in relation to the business of the employer of such employee, or the principal of such agent without the knowledge of such employer or principal.

Roosevelt Retains Right to Alter Code

"...I specifically retain the right to cancel this approval of said Code, or to modify said Code in such manner as may be required to prevent any unfair trade practices within the Rubber Tire Manufacturing Industry which may become evident in any investigations by the Federal Trade Commissions or in the application of said Code; and

"The Administrator is hereby directed to conduct such investigations as may be necessary to advise me fully within ninety days concerning the existence or development of any unfair trade practices within said Industry, utilizing the aid of the Federal Trade Commission in the expeditious determinaton of any complants concerning such unfair trade practices."

—President Roosevelt, in his Executive Order of December 21st, approving the Tire Code.

Section 6. No member shall, directly or indirectly, give or permit to be given or offer to give, money or anything of value, to any customer or prospective customer, or to anyone else upon the instigation and for the benefit of any customer or prospective customer, to induce such customer or prospective customer to purchase tires or tubes from such members.

Section 7. No member shall secure confidential information concerning the business of a competitor by a false or misleading statement or representation, by a false impersonation of one in authority, by bribery, or by any other unfair method.

Section 8. No member shall unfairly attempt to induce the breach of an existing contract between a competitor and his employee or customer or source of supply; nor shall any such member unfairly interfere with or obstruct the performance of such contractual duties or services.

Section 9. No member shall brand or mark or pack any commodity in any manner which tends to deceive or mislead purchasers with respect to the brand, grade, quality, quantity, origin, size or specification of such commodity.

Section 10. After February 1, 1934, no member shall manufacture any automobile, truck and/or bus pneumatic tires which do not clearly indicate on the sidewall of the casing and on the label the number of cord plies from bead to bead, built into the casing. Breaker strips shall not be construed as plies for sidewall or label marking. Plies extending from the heel of one bead to the heel of the other bead, if of substantially the same construction as other plies in the tire, shall not be construed as breaker strips. The Code Authority may designate such markings for purposes of this Section.

Section 11. The unauthorized use by any member either in written or oral form, of trademarks, trade names, or slogans identical with or in imitation of, those already in use by any other member, shall be prohibited.

Section 12. No member shall withhold from or insert into any invoice anything which would make the invoice a false record, wholly or in part, of the transaction to which it refers, or make any arrangement which contemplates payment or settlement contrary to the face of the invoice. No member shall post-date or pre-date orders, invoices, or contracts. This Section shall not prohibit the granting of a bonus in accordance with any member's regular program.

Section 13. Within ten days after the effective date of this Code, each member shall file with the Association all Consumers' and Preferred Wholesale and State Lists. The Consumers' Lists shall be the lists from which dealer and/or jobber discounts shall be applicable and shall apply to the sale of tires and/or tubes to owners of less than five vehicles. The Preferred Wholesale Lists shall apply to commercial operators of five or more vehicles. The State Lists shall apply to all State, County and municipal accounts. These lists shall be effective immediately upon such filing.

(a) Thereafter, no member shall change such lists without filing new lists with the Association, stating the effective date of such changes; provided that if such change involves a reduction such effective date shall be not less than ten days from the date of filing of the new lists.

(b) The Association shall, promptly after receipt of such revised lists, notify all members affected. Such affected members may thereupon file with the Association revisions of their lists which, if filed prior to the date when the revised lists first filed shall go into effect, may become effective on said date.

(c) No member shall fill at old prices orders received or showing postmark after 12:01 of the day upon which his new lists become effective. No member shall give any information to any class of trade regarding price changes prior to the date of filing thereof with the Association.

Section 14. No member shall solicit the reinstatement of any order previously cancelled, at other than his own current prices.

Section 15. Effective immediately upon the signing of this Code by the President, no member shall sell or offer for sale any tires or tubes which have been, or should be, propely classified as "seconds", except to employees for their own personal use and not for resale purposes. No member shall sell "firsts" as "seconds" under any circumstances.

Section 16. No member shall sell or dispose of any tires or tubes of obsolete, discontinued design or change-overs at special prices without first

(a) Notifying the Code Authority two (2) weeks in advance of the number of tires or tubes to be so disposed of, with the reasons therefor.

(b) Stating discounts below the regular established price at which they are to be sold.

(c) Branding such tires, other than change-overs, so to be sold with a suitable design that shall be designated by the Code Authority.

(d) Obtaining the approval of the Code Authority for such disposal. If the Code Authority denies approval or fails to notify such member of its decision within ten (10) days, such member may appeal to the Administrator who shall have power to grant approval. The Code Authority shall advise all members of the Industry simultaneously of such authorizations.

Section 17. For the purposes of Sections 16 and 17 herein "seconds", obsolete and discontinued designs shall be defined as follows:

(a) "Seconds" shall be defined as all tires and/or tubes which have become defective in the course of manufacture.

(b) Obsolete and discontinued designs shall be defined as all tires and/or tubes which have actually been discontinued from production.

(c) Change-over tires shall be defined as original equipment tires which have been removed from new vehicles and which are practically new or show only slight wear.

Section 18. No member shall extend dealers' prices to persons other than dealers as herein defined. If the application of this definition in any particular case should work an unjust hardship on any member of the Industry or customer, such member or customer may appeal to the Code Authority which shall have power to make such exception as justice may require.

Section 19. No member shall extend jobbers' prices to dealers.

Section 20. No member shall take over from any dealer or jobber, either by purchase or exchange, any tires and/or tubes of other members.

Section 21. No member shall offer or give any tires or tubes, or sell any such tires or tubes at reduced prices, for test purposes without prior approval by the Code Authority.

Section 22. No member shall offer to a dealer the discounts and/or allowances given to a warehouse dealer unless the dealer shall be required to perform the services of a warehouse dealer.

Section 23. The Code Authority shall within thirty (30) days after the effective date, obtain from the Tire Committee of the Tire and Rim Association standard specifications for the Industry covering cross sectional diameters, anti-skid depths, total tread thicknesses and such other specifications as in their judgment will standardize manufacturing tolerances within the Industry. When these standards shall have been submitted to the Industry and approved in accordance with Article X, the Association shall send a copy of such standards to every member of the Industry. Such standards shall become effective ninety (90) days thereafter and any deviation in the manufacture of any tires beyond the maximum so established, shall constitute an unfair trade practice unless such tires which exceed these specifications shall be sold at a proportionately higher price which truly reflects their higher cost. The Code Authority upon request of any member shall investigate and rule upon any disputed cases. Should the application of this Section in any particular case work an unjust hardship on any member of the Industry, such member may appeal to the Administrator who shall have power to grant such exception as justice may require.

Section 24. Effective immediately upon the signing of this Code by the President no member shall accept written or verbal orders, agreements or contracts for the sale of tires or tubes to any commercial and/or national account, the effect of which is to guarantee prices on future deliveries.

Section 25. Effective immediately upon the signing of this Code by the President no member shall use terms of payment to national or commercial accounts exceeding the customary 10th proximo terms or renew or extend existing orders, agreements or contracts as a subterfuge, in violation of Section 24. For purposes of interpretation of Section 24 orders delivered within thirty (30) days after date of order may be construed as "immediate delivery"; deliveries after such thirty (30) days period shall be construed as "future delivery" and billed at prices in effect on delivery date.

Section 26. No member shall offer for sale a rebuilt and/or retreaded tire without marking on the sidewall thereof a suitable design to be approved by the Code Authority.

Section 27. Violation of any of the provisions of Article VI shall be considered as unfair trade practice and subject to the penalties of the Act.

ARTICLE VII

A. Complaints and Appeal

Section 1. Any interested party shall have the right of complaint to the Code Authority and prompt hearing and decision thereon in respect to any matter arising under this Code. Such complaint must be filed in writing with the Code Authority within a reasonable period of time after the complaint arises.

Section 2. Any interested party shall have the right of appeal to the Administrator under such procedure as he shall prescribe in respect to any decision, rule, regulation, order, or finding made by the Code Authority.

Section 3. The Code Authority shall be specifically charged with the responsibility for proceeding against any member of the Industry who shall violate any provisions of this Code.

ARTICLE VIII

A. Monopolies

Section 1. No provisions of this Code shall be interpreted or applied in such a manner as to permit monopolies, or monopolistic practices, permit or encourage unfair competition; or eliminate, oppose or discriminate against small enterprises.

ARTICLE IX

A. Revisions and Modifications

Section 1. This Code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provisions of Subsection (b) of Section 10 of the National Industrial Recovery Act, from time to time to cancel or modify any order, approval, license, rule or regulation issued under Title I of said Act and specifically, but without limitation, to the right of the President to cancel or modify his approval of this Code or any conditions imposed by him upon his approval thereof.

Section 2. Such of the provisions of this Code as are not required by the National Industrial Recovery Act to be included herein, may, with the approval of the President, be modified or eliminated as changed circumstances or experiences may indicate.

Section 3. By presenting this Code, the Industry and others assenting thereto are not consenting to any modification thereof; and each reserves the right to object independently or jointly to any modified Code.

Section 4. If any member of the Industry is likewise engaged in part, in any other industry or trade, this Code shall apply only to such of the activities of said member as are comprehended within the Rubber Tire Industry.

Section 5. The provisions of this Code now or hereafter adopted with regard to prices, discounts, deductions, allowances, extras, commissions, or methods and/or terms of sale shall not apply to direct export sales. Upon application to the Code Authority, any member of the Industry may secure exemption from such provisions of this Code in regard to sales in the course of export (i.e., sales destined ultimately for export) or sales of materials used in the manufacture of products for export. The term "export" shall include, in addition to shipments to foreign countries, shipments to United States' possessions, except Alaska.

ARTICLE X

A. Alterations and Amendments

Section 1. Any addition, alteration or amendment to this Code may be proposed by any member of the Code, and after receiving the approval of fifty-one percent of the members of the Code, providing such members represent at least fifty-one percent in volume, shall be presented through the Code Authority to the Administrator for approval after such notice and hearing as he may prescribe. Provided, however, that any addition, alteration or amendment which has received the approval of either a majority in number or in volume of the members of the Code, may, after due notice to all members of the Code, also be transmitted to the Administrator for his consideration.

ARTICLE XI

A. Further Recommendations by the Code Authority

Section 1. Within sixty (60) days after the effective date of this Code, the Code Authority shall, after such negotiations as may be necessary, make recommendations to the Administrator for the equitable adoption of a uniform Standard Warranty by all members of the Industry and all tire retailers, jobbers, wholesalers, and special brand distributors. In the interim, no member shall change his present form of warranty.

Section 2. Since the leasing of tires to taxicab and bus companies on a time or mileage basis is an established practice in the Industry, the Code Authority shall make a complete study of this practice and submit recommendations to the Administrator within ninety days from the approval of this Code for the elimination of any unfair practices which may exist in this field.

Section 3. Upon completion of the cost control plan outlined in Article V, the Code Authority shall make recommendations to the Administrator for the simplification of the present number of lines of tires.

Section 4. The Code Authority shall proceed with a survey of the productive capacity of the Industry, and submit recommendations to the Administrator not later than March 1, 1934, concerning the desirability of limiting the creation of additional productive capacity in the Industry.

Section 5. The Code Authority pledges itself to undertake immediately a study of seasonal fluctuations in production and make recommendations to the Industry designed to afford a greater stability of employment.

Section 6. The Code Authority shall, in cooperation with the Code Authority to be set up for the Retail Rubber Tire and Battery Trade, submit recommendations to the Administrator for the establishment of a joint committee for the coordination of the Code for this Industry with that of the Retail Rubber Tire and Battery Trade with a view to joint consideration and proper determination of any common problems which relate to the distribution of tires and tubes.

Section 7. Within ninety days after the approval of this Code, the Code Authority with the approval of the members of the Code, in accordance with Article X, shall make recommendations to the Administrator regarding the establishment of a complete open price system for the Industry. In the meantime, every member of the Industry, within thirty days after the approval of this Code, shall file with the Administrator, or his designated agent, for his exclusive information, in such manner and form as he may request, all prices, discounts, bonuses, terms and conditions of sale to all customers, in order that the Administrator may be fully informed as to conditions in the Industry.

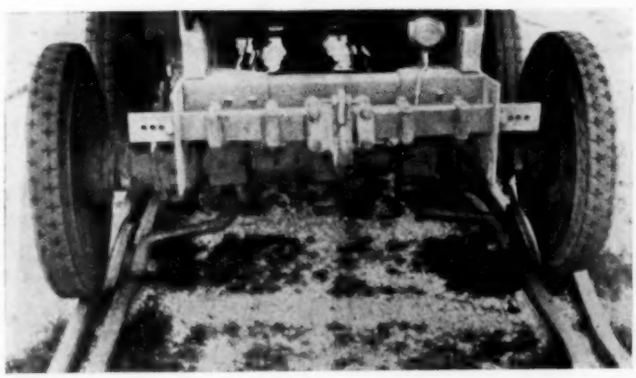
(a) Thereafter, no member shall sell any tires or tubes at prices lower or at discounts or bonuses greater or on terms or conditions more favorable than the prices, discounts, bonuses, terms and conditions filed as aforesaid, unless he shall first file revised prices, discounts, bonuses, terms and conditions with the Administrator to take effect in not less than ten days from date of filing.

ARTICLE XII

A. Effective Date and Termination

Section 1. This Code shall become effective, except as otherwise specified herein, on the first Monday after it shall have been approved by the President of the United States. It shall continue in effect until June 16, 1935, or until such time prior thereto when the President shall, by proclamation, or the Congress shall by joint resolution, declare that the emergency recognized by Section 1 of the National Industrial Recovery Act has ended.

New Wheel for Rubber-Tired Rail Cars



A PNEUMATIC-TIRED wheel designed to overcome the side sway in present rubber-tired rail cars is now in production at the plant of the Birmingham Railway Carriage & Wagon Company, Ltd., Birmingham, England. Instead of the usual steel flange forming an integral portion of the wheel center, which permitted the side sway, the new construction employs a separate guide wheel to enable the tire to function normally without outside interference or side strain.

A rail car fitted with this type of wheel is now being constructed at Birmingham to the order of a railway in another country. Wheels of this type have, however, been in use for some time on light Ford, Buick and Morris commercial vehicles adapted to both road service and rail service on the Entre Rios Railway.

The inventor of the new wheel is E. C. Noble, formerly chief mechanical engineer of the Entre Rios Railway. Sole manufacturing rights under his patents have been jointly secured by the Birmingham Railway Carriage & Wagon Company, Ltd., and D. Wickham & Company, Ltd.

Synthetic Rubber Production in Russia

DEFINITE progress in the production of synthetic rubber in Russia was made during 1933, according to authoritative reports from Moscow. Attention has been devoted chiefly to butadiene rubber, of which hundreds of tons have been made. Tires from such rubber are said to have given mileages up to 27,000 kilometers on Russian roads, and a large new factory for the production of the rubber is being built at Yaroslav.

The butadiene is made by a method developed by Lebedeff, which consists in passing ethyl alcohol under a slightly reduced pressure over a mixed dehydration-dehydrogenation catalyst, such as a mixture of alumina and zinc oxide. The yield is stated to be 20 per cent (34 per cent of the theoretical). Butadiene is isolated from the reaction products by absorption in kerosene or turpentine, after first cooling to —5° C. in order to remove higher boiling material.

Semi-large scale work is in progress on the recovery of butadiene from gas, obtained by the pyrolysis of oil, which is supplied to Leningrad and Moscow. Polymerization of butadiene in 70 per cent concentration is effected by means of metallic sodium. It is stated that the synthetic rubber has a wider temperature interval of elasticity than natural rubber; it will suffer lower temperatures without hardening, and at temperatures up to 80-100° C. it does not soften, but rather becomes somewhat harder. It can be reclaimed like natural rubber.

Rubber Content of Goldenrod

THE United States Department of Agriculture in 1933 conducted an investigation to determine the percentage of rubber contained in the goldenrod plant, which has been popularized in recent years by the experiments of the late Thomas A. Edison. From this investigation Loren G. Polhamus, associate technologist of the Division of Cotton, Rubber, and Other Tropical Plants of the Bureau of Plant Industry, concludes that the percentages shown justify the study of selection possibilities in relation to rubber content and the development of cultural practices conducive to the formation of rubber.

Samples of 24 species of goldenrod were analyzed, and significant quantities of rubber were found in the leaves of some of the samples. None of the species contained more than a trace of rubber in any portion of the plant except the leaves The highest rubber content was 6.34 per cent in one sample of a species known as *Solidago altissima*, while 10 other species showed a rubber content of more than 3 per cent.

Industrial Uses of Rubber Latex

A Summary of Uses to Which Rubber Latex Is Being Put in Many Manufacturing Processes

By D. F. TWISS

Part 2

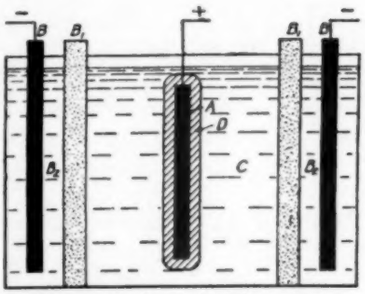
FOR the production of rubber articles of simple shape, such as motor tubes or rubber sheet, the rubber is conveniently deposited directly on the anode for which the most suitable metal is zinc because it undergoes anodic dissolution where a nobler metal would resist anodic attack and cause formation of bubbles of gas on the anode. The anode may be entirely of zinc or merely zinc plated. It is desirable to keep the anode voltage below the decomposition potential for water.

For articles of more complex shape a method is possible which incidentally obviates the danger of porosity from anodic gases. The anode is surrounded by a porous diaphragm of the desired shape. This porous surround also conveniently contains a solution of a saline substance of which the cation is a coagulant for rubber. In these circumstances the compounded rubber is deposited as a wet but tenacious layer which may be built up to half an inch in thickness and only needs to be dried and vulcanized. In this connection it must be emphasized that the wet rubber deposit is reticular in structure, but consolidates naturally during drying. In the freshly deposited condition it is permeated by the aqueous medium and freely permits the passage of the electric current. Another feature which should be mentioned is that as the bath is normally kept agitated actual electrophoretic movement is not responsible for bringing the globules of rubber and the particles of compounding ingredients to the surface of the anode or of the porous anode "surround," the main electrical effect being the deposition of a coherent rubber layer.

Applications of Anode Process

The anode process can be applied to the manufacture of many types of important articles including such as have fabric reinforcement, but it has to compete with simpler dipping processes (see later). It has however, particular advantages for the rubbering of metal wire screens and for the production of rubber sheets in which a complex perforated pattern is necessary. An example is provided by the rubber corset which has an intricate pattern of ventilation holes. The perforations which in manufacture by old methods were introduced by hand punching now result from non-deposition of rubber on small ebonite studs inserted in the zinc anode.

By modification of various factors such as the degree of alkalinity of the latex and the proportion of stabilizing agents and of additional electrolytes present, it is possible to adjust the consistency and water content of the rubber deposit obtained by anode deposition. It is also practicable to arrange for the deposit to be of different thicknesses in various parts by suitably screening or shaping the electrodes and adjusting their distance from one another and by other devices enabling modulation of the distribution of the current over the anode. An additional important feature of the anode process is that it permits automatic adjustment of the concentration of the rubber dispersion. The deposition of the compounded rubber on the anode naturally tends to weaken the bath, but by enclosing the dispersion in an appropriate porous ceramic or asbestos diaphragm and placing the cathode outside this in dilute aqueous ammonia, it is possible by electric endosmosis to cause serum to flow from the dispersion into the cathode space at such a rate that the latex dispersion remains constant in composition and concentration and needs merely to be replenished so as to maintain the necessary depth.



A schematic drawing of a cell for anode electro-deposition of latex on metal. The deposit is 40 percent water and therefore a conductor

Dipping process.—The principle of this process can be applied in a variety of ways. A plain dipping process can be used for the production of such articles as sacs for fountain pens and other purposes, tobacco pouches, rubber shoes, teats, surgeons' gloves, etc. The dipping process can be used with ordinary latex (which customarily will have been compounded), but in order to reduce the number of immersions to build up an article of the necessary stoutness of wall, latex of increased viscosity and also increased concentration is to be preferred. With compounded latex which has been concentrated to a content of about 60% or 70% of total solids it is possible by one or two immersions of the dipping former (conveniently of aluminum or glass) to produce an article which by dipping with ordinary rubber solution would require almost as many dozen immersions. It is convenient to effect surface coagulation of the deposited film by momentary immersion in a coagulant, *e.g.*, dilute acetic acid or even acetic-acid vapors. The first layer is thereby prevented from distortion or slippage during subsequent operations such as drying or further dipping, only one drying operation being necessary even for an article built up by several immersions. Indeed by stripping the wet article from the form at this stage, drying of the hollow wet rubber is expedited and the form can be re-

NOTE—This article is continued from the December, 1933 issue of THE RUBBER AGE.

turned at once to the cycle of operations. Vulcanization can be effected during the drying or subsequently.

The condition of the final latex coating before coagulation permits the development of noteworthy decorative effects. If the final film of latex has the necessary degree of stability, it is possible by immersion in an aqueous coagulant of relatively high specific gravity to cause the formation of localized breaks and folds in this final layer with production of an attractive "crocodile skin" effect. On immersing the dipping former with its wet latex coating for 2 minutes in a mixture of swelling agent and coagulant (*e.g.*, benzene 40 vol., acetic acid 1 vol.) there results an attractive corrugation of the surface whilst the additional presence of a non-solvent for rubber (*e.g.*, alcohol 40 vol.) in the bath leads to a fine surface-wrinkling of a type advantageous to such articles as surgeons' gloves. It is also possible to produce a matt finish on the uncoagulated latex surface by dusting with a water-soluble powder such as common salt. Colors or even colored latex can also be applied by spraying or by dipping, the colors in the latter case being either in solution or dispersed in water or merely floating as films on water. Thus it is possible to produce either a uniform color or a mottled or marbled effect.

Variations of Dipping

In order further to facilitate the production of articles of considerable thickness from latex, whether concentrated or not, a very useful device is that of so-called ionic deposition or coagulant dipping. The dipping former in this case is coated with an adherent film of coagulant (which can easily be arranged in various ways) and is then immersed in the latex. The migration of the coagulant into the surrounding latex expedites manufacture not only by rapid formation of a shaped coagulum, but also by reduction of the number of immersions necessary for thick deposits; many types of articles can thus be produced. By varying the thickness or concentration of the coagulant film on the former it is possible to obtain products with localized thickening, so that in the manufacture of rubber gloves the palms and the front of the fingers can be made stouter than the remainder. It is possible by ionic deposition to produce rubber boots and shoes not only of plain rubber, but with fabric reinforcement. Even industrial boots and Wellingtons can be thus manufactured, but the thick soles are conveniently prepared by the old method from masticated rubber. A simply produced article of distinct utility is a fabric-lined glove with a rubber exterior produced by fitting a cotton glove on a former; the surface of the fabric is then damped with a dilute alcoholic solution of acetic acid and immersed in the latex. On withdrawal after a few seconds and subsequent drying and vulcanization the article is complete. It is of interest that ionic deposition probably plays an important part in the anode process: in the case of an anode surrounded by a porous diaphragm which constitutes the shaped mould, ionic deposition must be the main channel of action of the electric current. Even with deposition directly on a metallic anode, after the anode has once become coated with a continuous film of coagulum the further deposition of rubber must follow by electrically aided migration of metallic ions from the anode through the permeable wet coagulum.

A further device to effect controlled deposition of rubber from latex on to a shaped surface is by so-called heat-sensitization. There is added to the latex in this case a small proportion of some agent, *e.g.*, calcium sulphate, certain organic accelerators of vulcanization, a mixture of zinc oxide and an ammonium salt or of ammonium persulphate and a reducing agent, which at higher concentrations or at higher temperatures would be capable of inducing coagulation. The treated latex, however, is of reasonable stability and remains in good condition for considerable periods at the ordinary temperature. On immersion of a hot former into such heat-sensitized latex a layer of rubber coagulum is gradually built up, and when of the desired thickness can be removed with and dried on the former. An interesting development has been the recent successful commercial application of heat-sensitive latex to the manufacture of hollow articles such as play balls (see later).

Filtration has been commercially applied in the United States as a method for the production of motor tubes by immersing a perforated mandrel coated with superposed layers of fabric and cohesive wet powder such as clay in compounded latex; the serum passes through to the interior of the mandrel, which is under reduced pressure, and a compact coating of wet compounded rubber gradually forms on the outer surface.

The Process of Spreading

Spreading, which may be considered as a special case of a dipping process, is today applied in many different ways, and in some directions on a very large scale for manufacturing purposes. Large quantities of latex variously compounded are used as or in adhesive or stiffening material in the manufacture of ordinary shoes (in preparing constructional parts and in making cutting-blocks), the consumption in this direction in 1930 being equivalent to 8,000,000 lbs. of rubber. Large quantities are also used for the sealing of millions of cans, the seam in the side of the can and between the side and the base being filled with a core of rubber composition which is applied in the form of a latex paste. Latex is also used on a large scale for proofing textiles of all kinds, *e.g.*, for raincoats and for producing spread rubber sheet.

Horse hair or similar fibre for upholstery is treated in its final expanded condition with compounded latex so that after drying and vulcanization, the relative position of the individual strands is fixed giving increased resilience and permanence of shape. A mixture with gelatin or with gelatin and glycerol has been applied to reduce the permeability and consequent leakage of gasbags for airships and of inner-tubes for motor tires.

One of the early suggestions in the latex "renaissance" was that of F. Kaye in 1920 for its use as a sizing material in paper manufacture. Although this suggestion has not been adopted as widely as seemed likely at first, it contained the germ of the idea for the use of latex in bonding fibrous materials generally. To-day, latex is used largely as a binding agent, *e.g.*, for bonding abrasives, and to convert leather dust or disintegrated fibre into artificial leather, to consolidate crumbed rubber waste into various products and, mixed with emulsified wax, to proof cork lids and cardboard containers. Large-scale experiments are in progress in different parts of the world on its application as a binding material with or without cement for road construction and surfacing. In this direction a mixture of stabilized latex with cement and with or without other fillers (including emulsified bitumens) is of especial promise, Such mixtures can also be used, for the protection of the inner surface of concrete-lined, or of wood or metal, tanks.

Production of Rubber Thread

As a final illustration of a special form of the dipping process may be mentioned the production of rubber thread. The latex, preferably concentrated compounded latex, is allowed to flow through a small orifice into a suitable coagulant bath, *e.g.*, acetic acid, or a bath capable of effecting osmotic dehydration and setting, *e.g.*, ammonium acetate, through which it is drawn continuously to conveyors on which it can be spray-washed, dried, and even vulcanized in a continuous operation. The thread so obtained is of circular cross-section, and in addition to having the special

properties associated with latex rubber, can be obtained in very fine "counts" as low as 1/125th of an inch in diameter. The surface of such thread moreover is smooth, whereas that of ordinary thread which is cut from thin sheet is distinctly rough. Unlike "cut thread" there is also no limit to the length which can be produced continuously.

Latex for Moulding Purposes

Moulding.—It is possible of course to use latex indirectly for moulding purposes by conversion either into a dry mixing or into a dry crumb, the latter being possible, for example, by a suitably modified "latex precipitate" process, and then to produce shaped articles either by an ordinary rubber moulding operation or, in the case of crumb, by shaping in a similar type of mould to that used for synthetic resin moulding powders. The articles thus formed can be either of the soft rubber type or ebonite type accord- to requirements, the main difference being in the proportion of sulphur employed for vulcanization. Moulding of latex by gelation or coagulation to a continuous solid mass in a shaped cavity has two distinct disadvantages, namely, the slowness of complete drying of a wet coagulum of substantial dimensions and the shrinkage which occurs during drying of a coagulum of soft rubber. These disadvantages, however, are obviated and important advantages gained in at least two special cases of this type of moulding. If the latex containing sufficient sulphur is vulcanized to the condition of ebonite in circumstances substantially preventing the loss of the entrained water, the resulting ebonite retains the dimensions of the mould, the water being very finely distributed throughout its mass. On drying, a light-brown microporous ebonite is obtained, the pale color being due to the discontinuity of the surface; pure ebonite dust also is brown. By selecting the concentration of the original latex, it is possible to produce ebonite with microporosity as high as 80% of the total volume or as low as 15% or less. If it is desired to reduce the microporosity still further, the wet gel can be pressed to remove any predetermined amount of water before vulcanization. For ordinary purposes, however, a convenient proportion of pore space to solid material is of the order of 45% to 55%. To the naked eye such ebonite has a smooth surface; it can be polished. In compression of the dry material darkening results, but application of heat causes recovery of the original structure and color. Microporous ebonite of this kind probably contains hundreds of thousands of pores per sq. cm. of surface, the diameter of the pores averaging a few ten-thousandths of a millimetre. It can be used for filtration purposes, and is particularly applicable in the form of diaphragms for electric batteries and accumulators. Even if the rubber is not vulcanized to a hard condition, the shrinkage of the rubber to a solid mass may not be complete, and it is possible to obtain microporous soft rubber, the practical advantages of which, however, are more limited.

After adding a small proportion of a frothing agent, such as an alkali soap to compounded latex, it is possible to beat this into a froth which by the addition of a coagulant with delayed action, *e.g.*, an aqueous suspension of sodium silicofluoride, can be caused to set or gel after pouring into moulds. The resulting gel constitutes a wet unvulcanized rubber sponge of remarkable uniformity of texture. After vulcanizing the ultra-accelerated froth-gel by immersion of the filled moulds in a bath of hot water the serum and additional water can be removed by squeezing or centrifuging, followed by drying which occurs rapidly. In this way it is possible to produce as single units sponge rubber cushions, arm-rests, back-rests, seats, "squabs," etc. or mattresses of any desired shape, as well as simpler small articles of all kinds, such as household sponges, heel supports, etc. In the older method of production of sponge from dry rubber it was generally necessary to assemble sponge for upholstery by a tedious constructional process from quite small pieces. This new method for making rubber sponge is one of the striking developments in the application of latex. The porosity of the sponge is of a continuous type; the air cells interconnect and thereby provide continuous natural ventilation during use. By lining the mould partially with a continuous film of rubber, *e.g.*, by spraying, sponge rubber aeroplane wheel "fairings" can be made with a smooth non-porous outer surface.

The frothed latex can also be used in other ways, *e.g.*, for dipping purposes so as to produce articles with a soft sponge-rubber covering; it can also be spread, for example, to form a backing for carpets to provide increased softness and resilience. Another striking application is in the preparation of moulds for the production of ornamental cement castings such as are popular in gardens. The pliability of the sponge enables the removal of castings with undercut portions such as are difficult to obtain with any other type of mould. The frothed latex is cast in the first place to produce the necessary matrix and after vulcanization and drying is ready for use.

Mention has already been made of the possibility of moulding seamless hollow goods such as balls and toys by introducing appropriately compounded, concentrated latex into the inside of suitable moulds. Coagulation of the internal latex layer is effected by gentle heat. After removal of the unvulcanized article from the mould it can be dried and, when vulcanized, inflated by means of a hollow needle in the usual way. Any plug which may be necessary finally to seal the article at the point of insertion and withdrawal of the needle can be placed in position before the mould is closed. This process is being operated commercially at the present time.

Application of Latex to the Protection of Metals, Etc.

In many of the above processes it will be seen that the latex is deposited initially on a shaped former from which it is subsequently removed. If desired it is also possible to secure the latex in position so as to impart protection of the under-surface against corrosion by the atmosphere or chemical agents, and for this end latex has obvious advantages over rubber sheet which can be applied only to geometrically simple surfaces. If the protective film is to be of ebonite mere vulcanization to the hard condition alone may impart sufficient firmness of adhesion particularly if the under-surface is of copper or has been copper coated. For the ultimate firm attachment of the latex deposit to metals special compounding ingredients, *e.g.*, hæmoglobin can be helpful, but generally it is advisable to apply a preliminary film of adhesive capable of providing a strong bond between the metal and the rubber. Such adhesives can be applied either as solutions or as emulsions; in the latter case the principles of application, *e.g.*, anodic, ionic, or simple dipping, can be almost identical with those in the use of latex itself. The so-called "thermoprene" type of adhesive obtained by the chemical modification of rubber by heating with sulphonic acids is suitable. It is of interest that an adhesive of this class, *e.g.*, "Vulcabond" can be obtained by the direct action of the agents on latex. The dispersed rubber in latex is in very convenient condition for treatment by hydrolytic agents, *e.g.*, enzymes or alkalis and it is therefore possible to remove natural protein and other organic non-caoutchouc constituents. Such deproteinized rubber, after washing and addition of waxes, has proved of especial value for purposes of electrical insulation.

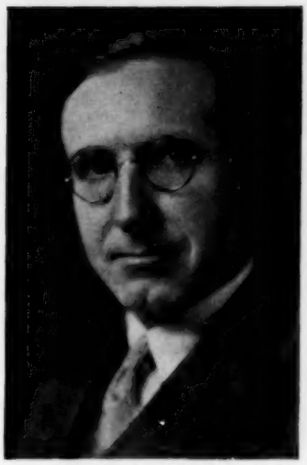
In the above discussion of the industrial uses of rubber latex reference has been made particularly to natural latex and its modifications. It must be remembered, however, that artificial "latex" can be produced by the dispersion of

(Continued on page 176)

BRUCE R. SILVER
Elected Sec.-Treas.

New York Group Christmas Party

Nearly 200 Chemists and Guests At Annual Affair of Rubber Group



Blank & Stoller
CARL J. WRIGHT
Elected Chairman

MEMBERS of the New York Group, Rubber Division, A. C. S., held their annual Christmas Party on December 15 at the club rooms of the Building Trades Employers Association, 2 Park Avenue, New York City. With 189 members and guests in attendance, an elaborate program was presented that maintained the high standard established by similar affairs conducted by this Group during the three previous years.

The meeting was preceded by an excellent dinner, at which each diner received table favors, consisting of erasers donated by Stamford Rubber Supply Company and playing cards donated by Wishnick-Tumpeer, Inc. Election of officers for 1934 resulted in the unanimous choice of those whose names are given elsewhere on this page. They had been proposed by the Nominating Committee, composed of W. L. Sturtevant, W. M. Morse and Peter P. Murawski. A vote of thanks was given to the outgoing officers.

Two extremely interesting papers were then presented. Kingsley Gillespie, of the Stamford Rubber Supply Company, discussed "The Use of Factice in the Rubber Industry," and Dr. Theodore M. Switz spoke on "Recent Developments in the Soviet Chemical Industry." [Abstracts of both papers appear below.]

The questionnaire contests, which had featured previous Christmas parties, were continued and aroused more than usual interest. An "X" contest, in which members vied to list the greatest number of trade marked materials whose names end with the letter "x" was won by O. M. Hayden, E. I. duPont de Nemours & Company, Wilmington, Del., with second prize going to F. S. Conover, Manhattan Rubber Company, Passaic, N. J. A general information contest, in which members were asked to identify photographs of well known people and trade marks of nationally advertised products, was won by M. H. Savage, General Electric Company, Bridgeport, Conn., with M. N. Nickowitz, E. I. duPont de Nemours & Company, Fairfield, Conn., taking second prize.

The Sabas, Mexican entertainers, featured the entertainment program with songs and dances to native music, which were well received. "Tex" Ritter, the well-known radio star, sang a number of cowboy ditties with the help of a borrowed guitar, and won such enthusiastic appreciation that he was forced to give encore after encore. Walter H. Grote, of the United Carbon Company, gave an exhibition of a few of his latest card tricks.

The program was brought to a conclusion by the drawings for the eighty Christmas gifts contributed for the occasion. These presents ranged from golf balls, cocktail shakers, cigars, toilet kits and bath sets to a live goose which was given by "Dave" Scott. Other contributors of gifts to the Christmas party included the following:

American Character Doll Co., Ansbacher-Siegle Corp., Binney & Smith Co., Carter-Bell Mfg. Co., Callaway Mills, Carter Latex Corp., E. I. duPont de Nemours & Co., Endicott-Johnson Co., General Atlas Carbon Co., J. M. Huber, Inc., Imperial Color Works Co., *India Rubber World*, New Jersey Zinc Co., Naugatuck Chemical Co., Peter P. Pinto, Philadelphia Rubber Works Co., Pequanoc Rubber Co., THE RUBBER AGE, Rubber Service Laboratories Co., Henry L. Scott Co., Stamford Rubber Supply Co., Somerset Rubber Reclaiming Co., Southwark Mfg. Co., R. T. Vanderbilt Co., United Carbon Co., Vulcan Proofing Co., Wishnick-Tumpeer, Inc., C. K. Williams & Co.

Officers of the New York Rubber Group 1934

Chairman: Carl J. Wright, *General Atlas Carbon Company*
Secretary-Treasurer: Bruce R. Silver, *New Jersey Zinc Company*
Executive Committee:
L. A. Edland, *R. T. Vanderbilt Company*
A. R. Kemp, *Bell Telephone Laboratories*
W. M. Morse, *India Rubber World*
Peter P. Murawski, *E. I. du Pont de Nemours & Company*
Peter P. Pinto, *The Rubber Age*
Emil W. Schwartz, *General Electric Company*
K. J. Soule, *Raybestos-Manhattan, Inc.*
William F. Tuley, *United States Rubber Company*

ABSTRACTS OF PAPERS

The Use of Factice in the Rubber Industry

Kingsley Gillespie, Stamford Rubber Supply Company

After mentioning briefly the three classes of Factice according to the method of vulcanization of the vegetable oil, the author described the use of each type in rubber compounding.

The chief use of White Factice is in erasers where in

very high percentages it is responsible for the rapid wearing away of the stock to form the noodles which absorb the pencil marks. The effect of White Factice on accelerators limits its use largely to acid-cured stocks such as hospital sheeting to which it gives what is called a "velvet feel".

Brown Factice is used extensively in such proofed stocks as auto topping and raincoat fabrics in which the effect is noticed in the uncured as well as the cured stock. Besides the processing effects on the uncured stock Brown Factice was reported to give body and softness to the cured stock and increased combining strength to double texture stocks especially after ageing.

The author described briefly several special uses of Brown Factice such as in sponge, rubber rolls, insulation, latex, etc.

The effect of Brown Factice on a compounded Duprene stock was shown to be largely one of dilution with an unusually small effect on tensile and oil resistance. In Duprene it apparently serves a double role, that of a low gravity compounding ingredient as well as a non-thermoplastic softener.

Recent Developments in the Soviet Chemical Industry

Dr. Theodore M. Switz

Dr. Theodore M. Switz, who recently returned from a trip to Russia gave a very interesting and instructive talk on the Soviet chemical industry.

The development of the chemical industry is very closely tied in with the famous "Five Year Plan" and, according to Dr. Switz, remarkable strides have been made in the production of many chemicals—particularly sulphuric acid and fertilizers. By-product coking operations have also shown a remarkable growth.

Perhaps the most interesting part of the discussion had to do with the production of synthetic rubber. This material is being produced on a large scale by several plants and tires built of this rubber wear better than tires made from natural rubber. Admittedly synthetic rubber is more expensive but it has an economic advantage in that it can be produced from local materials by local labor and does not necessitate the export of gold.

Dr. Switz stated that most of the chemical plants are under the direction of Russian chemists who are very well trained and very capable. He also gave a number of references to technical Russian papers which should be of interest to American chemists.

Rubber Thread

(Continued from page 166)

Referring to Figure 3, it might be asked just what effect will this have on fatigue and rubber. This is shown in Figures 4 and 5. Figure 4 shows, left and right, the condition of rubber before and after anchorage of yarn with square rubber thread, and Figure 5 the same with round. In the case of square thread (Figure 3), the corners 1, 2, 3 and 4 were compressed, there being little work or resistance offered by the mid-sections between the adjacent corners of rubber, and sure anchorage, while in the case of round thread the work had to be done against the whole volume of rubber, and in addition maintained thus. The ultimate results are illustrated in Figures 6, 7, and 8. Figures 6 and 7 show rubbers flexed in webbing 1,500,000 and 500,000 times, respectively, and Figure 8 the same rubbers in comparison under the same slight stretch. A lubricant was used in the sample shown in Figure 6 but it could not be applied in the rubber shown in Figure 7 as the anchorage of the round thread did not permit it. When lubricated round rubber breaks, it snaps back into its channel thus destroying relative comparison.

From all outward appearances, nothing can be judged of the correct nature or manufactured qualities of rubber thread. Figure 9 shows what equal sizes of Para and round latex thread look like. Figure 10 is a section of a white fine cut rubber thread from plantation rubber. Figure 11 shows a thread from extruded latex, and Figure 12 a latex thread by the Fritz Cremer or fountain pen method.

Conclusion

Para or wild rubber has been shown to possess superiority over the others when subjected to thread manufacture with reference to its life and ration of "come back" or "kick".

Plantation and latex rubbers have very little competition as far as obtaining light and brilliant colored threads is concerned.

Extrusion method of thread manufacture has advantages over the others in making extremely fine sizes that are beyond capabilities of modern cutting machines.

Better anchorage of the yarn to the rubber is obtained on square or triangular thread.

Industrial Uses of Rubber Latex

(Continued from page 174)

rubber (new or even "reclaimed") and that similar processes can be applied to artificial latex and to the natural product. Eventually for certain purposes it may prove economical to ship dry rubber from the plantations with saving in transport costs and to emulsify the product in the home factory to give "latex" of the desired degree of alkalinity and stability. An obvious disadvantage is that the rubber during and possibly also before the emulsification or dispersion process would necessarily be submitted to some degree of milling or mastication with impairment of the strength of the latex rubber. However, a maximum of tensile strength is not always the main requisite.

At one time there was a tendency for prospective users of latex to follow the lines of the ordinary methods of rubber manufacture; it was, for example, frequently suggested as sufficient advantage to mix the latex (either containing its natural proportion of rubber or in a concentrated form) with compounding ingredients of the standard type and then to convert the mixture directly to an unshaped condition for concurrent moulding and vulcanizing by existing works processes. In the light of experience, however, two distinct fields of manufacture can now be discerned for one of which dry rubber still has economic advantages, while latex offers attractive possibilities in the other. An outstanding feature of latex is that it renders possible new lines of manufacture and new methods for which ordinary rubber is unsuited. Some evidence of this has been indicated in the foregoing. Latex indeed is finding application on a very considerable scale in industries which in the past were regarded as quite outside the rubber industry. It is always unsafe to prophesy, but there is a distinct likelihood that the most important lines of development of latex manufactures will be supplementary to rather than competitive with the old-established "heavy" rubber industry.

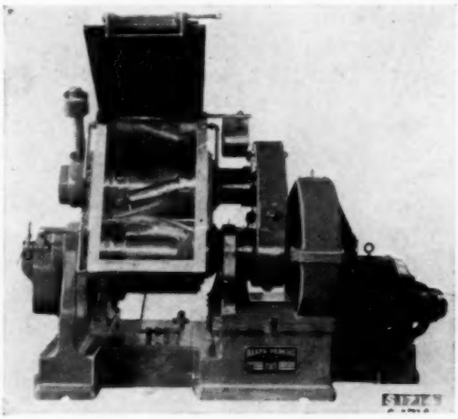
Reprints of Latex Abstracts Available

Any of our readers desiring reprints of the abstracts of United States patents on rubber latex, which were prepared by Frederick Marchionna and published in our October and November, 1933, issues, may obtain copies by addressing the Editor.

New Equipment

Mixer for Rubber Dispersions

The accompanying illustration shows a mixer of 70 gallons working capacity, one of the production sizes in the line ranging from the half-gallon laboratory size to the 100-gallon size. All of these machines are of heavy construction to allow for the heavy loads encountered in making aqueous or solvent dispersions of rubber. Interesting features of this machine are the blades which are



a special type developed especially for this work; trough ends as well as trough shell jacketed to permit close temperature control; chrome-plated trough and blades; tilting of trough by power.

Glands are of a new metal-to-metal packingless type completely separate from the bearings. Gears are totally enclosed and run in oil, thereby insuring silent operation and long life. The tilting mechanism consists of a small motor connected to the tilting screw instead of the former clutch tilt type. (Baker-Perkins Co., New York City).

ERRATUM

In the December issue of THE RUBBER AGE, a description of the Baker-Perkins Company's "Rotacan" Mixer was incorrectly illustrated by a view of the mixer for

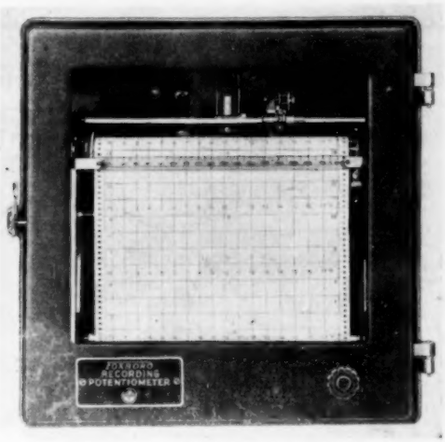
rubber dispersions just described. A photograph of the "Rotacan" Mixer is, therefore, reproduced herewith.

Foxboro Recording Potentiometer Pyrometer

A NEW and unique type of balancing mechanism is one of the important features of the new Recording Potentiometer Pyrometer manufactured by the Foxboro Company, of Foxboro, Mass. This balancing device is so designed that it produces a large movement of the pen or print wheel for a small galvanometer deflection and moves the printing mechanism from one end of the scale to the other in a minimum of time, without requiring an extremely fast cycle or rapid motion of the mechanism.

It is claimed that this feature accounts for the instrument's rapid frequency of records, long wearing mechanism, and open, easily-read chart scale. The balancing mechanism consists essentially of a V-shaped drive cam and a friction roller.

The recorder is housed in a new fume-tight and dustproof case that is so designed that it may be either flush or surface mounted. The case aluminum door with large



glass window makes the chart and interior of the instrument highly visible.

The connection compartment of the recorder, which is sealed from the interior of the case and is accessible from the outside, allows thermocouple and motor connections to be made or inspected without opening the main compartment containing the mechanism.

New York Automobile Show

USES of rubber in automobile designs were more pronounced than ever in the displays of new car models at the 34th Annual National Automobile Show, held at the Grand Central Palace, New York City, from January 6 to 13. Aside from tires and tubes, rubber was employed in from thirty to sixty points in the new cars, its use extending from engine mountings, steering wheels and floor mats to door bumpers, weatherstrip and crankshaft dampener.

The only tire manufacturers maintaining their own exhibits at the show were the Custom Built Tire Corporation of America, New York City, and the Armstrong Rubber Company, Inc., West Haven, Conn. The former showed its line of Martin 8-ply low pressure cord tires, while the latter displayed its new Chroma casings in a full range of colors, including maroon, orchid, green, blue, yellow, brown and other shades.

In its usual compilation of statistics of the industry, the National Automobile Chamber of Commerce figures that the automotive trade consumes 80 per cent of all rubber used. An exhaustive description of the employment of rubber in 1934 automobile models will appear in the February issue of THE RUBBER AGE.

Editorial Comment

Added Honors for Mr. Viles

THE Rubber Manufacturers Association is to be congratulated on the selection of their General Manager, Mr. A. L. Viles to assume the added duties of the Presidency of the Association. Mr. Viles has given long years to the service of the industry and his thorough knowledge of its many problems should help it to meet the future with renewed confidence. Our felicitations go to Mr. Viles—may his tenure of office be long and successful.

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The Codes Are Adopted

WHEN General Johnson, in transmitting the Tire Code to President Roosevelt, wrote that "no other industry can derive greater benefits" from the National Industrial Recovery Act, he voiced the sentiments of all who have watched the operations of that field of manufacturing during the past fifteen years. The new agreement is not being hailed blindly as a panacea that will bring instant relief and new prosperity to an industry that has for so many years been embroiled in internecine strife; yet, in the words of General Johnson, "It does represent a real beginning."

That tire manufacturers have agreed among themselves to adopt twenty-seven trade practice provisions to eliminate as many forms of unfair competition is important. That steps will be taken toward the adoption of a standard tire warranty, toward the incorporation of an adequate cost recovery provision in the code, and toward other provisions designed to improve manufacturing and marketing conditions, is vital. But the outstanding accomplishment of the code negotiations, overshadowing all details concerning policies and practices, is that these manufacturers, so long embattled, have been able to meet upon a common ground to draft regulations beneficial to their industry and that they profess to see in this document a definite start in the direction of mutual cooperation for better practice.

There will be future changes and rectifications as experience will demonstrate the need of such changes. Minor difficulties will be ironed out satisfactorily. The chief victory, however, lies in the fact that these industrialists have finally been willing to sit around the council table and plan a tangible program for the improvement of their business. Even if the code itself shall be permitted to expire at the end of its stated term in June, 1935, the benefits to be gained from this effort toward cooperative action will long continue.

Although accomplished with less fanfare, the adoption of a code of fair competition for the other branches of the rubber industry will also have far reaching effects. Its provisions are substantial enough to make R. J. Funkhouser, president of the O'Sullivan Rubber Company exclaim, "For the first time since the effects of the depression, the industry now can look to the future with confidence."

All in all, the rubber manufacturing industry has taken a definite step forward. Dun & Bradstreet, Inc., leading credit agency, is justified in terming the adoption of these codes "the outstanding event in 1933 for the industry." Measurable betterment in conditions should follow their administration. The future history of the industry will undoubtedly record their lasting effects.

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What of 1934?

IF PREDICTIONS for 1934 do not carry the easy assuredness of quickly returning "better times" that was still prevalent at the beginning of 1930 and 1931, they at least are not tinged with the note of comparative despair that was seen in early 1932 and 1933. There is a rightful feeling of confidence, but it is tempered with sanity. We know that business is on the trend upward out of the depression, yet we do not look for miracles.

The rubber manufacturing industry is particularly justified in expecting improvement during the current year. Together with a larger demand for original equipment tires, it now appears likely that the latent need for replacement casings will finally assert itself. The footwear trade is already experiencing a revival, and other branches of the industry anticipate better sales. The financial position of the individual companies is sounder than for several years past, and many have heavy inventories of raw materials purchased at prices well under the present market. The enforcement of the recently adopted NRA codes will eliminate most of the discord that has tended to hamper the industry.

The present year may not see any single month in which the record-breaking production of June, 1933, is equalled; but neither will it witness any month in which activity drops to the low level of March of last year. Rubber factory production for the entire year should exceed that of 1933, but the increase will be felt gradually and the rate of activity should be more evenly spaced without radical rises and dips.

CURRENT • NEWS
of the Rubber Industry

JANUARY, 1934

Rubber and Tire Industry Codes Are Approved; NRA to Investigate Practices in Tire Trade

President Roosevelt Directs General Johnson to Probe Unfair Acts with Federal Trade Commission Aid—Leaders Voice Approval of New Regulations

CODES of fair competition for the tire industry and for the balance of the rubber manufacturing trade were decided upon and approved by President Roosevelt last month after a protracted disagreement over certain of their proposed terms. The code for the general industry was formally approved on December 15, while the regulations for tire manufacturers were endorsed by the President on December 21.

The general industry code was given Presidential approval without reservations. In signing the tire industry code, however, President Roosevelt not only specifically reserved the right to modify or cancel the code at any time but also directed General Hugh S. Johnson, NRA Administrator, "to conduct such investigations as may be necessary concerning the existence or development of any unfair trade practices within the industry, utilizing the aid of the Federal Trade Commission" and to make a full report thereon within 90 days.

Final agreement among the tire companies was won only after F. A. Seiberling, President of the Seiberling Rubber Company, personally called a meeting of 24 smaller manufacturers at Washington and gained their endorsement for the provisions of the projected code. The Rubber Tire Manufacturing Industry Code is reproduced in full on Pages 167 to 171 of this issue of THE RUBBER AGE.

Sales Control Omitted

The majority of the features desired by the leaders of the industry were retained in the final draft of the tire code, but all reference to plans for a temporary differential control of sales within the industry was eliminated. The feature of posting prices was adjusted by the provision that all prices should be filed with the government and not made public until after the hearing in the federal court of the case against the Goodyear Tire & Rubber Company.

In its industrial relations policies, the code provides for minimum wages of 40 cents an hour, and a 36-hour week for factory workers. The minimum salary rate for Akron factory workers is $14 a week. The so-called "merit clause" was not included, and labor views its rights in this respect as fully protected.

Provision is made for a Code Authority of eight members to be selected by the industry to administer its regulations and to work out problems of production and employment stabilization, price control, regulation of mass distributor and mail order sales, tire guarantees and other trade practices. In addition, the NRA has named Assistant Administrator Robert W. Lea and Deputy Administrator A. L. Kress to represent the government as non-voting members of the Code Authority. The Rubber Manufacturers Association, Inc., will play an important part in executing the provisions of the code, and its president and general manager will act as ex-officio members of the Code Authority without voting power. The general manager of the Association will act as Chairman of the Code Authority.

The tire code will affect some 35 companies and 50,000 workers. Mr. Seiberling, in commenting on its adoption, said, "It is the best that could be produced out of the conflict of opinion and interest that has prevailed, and the benefits therefrom will develop immediately after it has been put into effect." His expressions of faith in its success were followed by similar words of praise by Harvey S. Firestone, Sr., P. W. Litchfield, and other leaders in the industry.

Code for Rest of Industry

Although established with less publicity, the code for the balance of the rubber manufacturing industry will be even more extensive in effect, regulating the activities of approximately 400 establishments and some 60,000 to 70,000 employees. This code comprises basic provisions for the industry together with nine supplementary codes for the following divisions of the industry: Automobile Fabrics, Proofing and Backing; Rubber Flooring; Rubber Footwear; Hard Rubber; Heel and Sole; Mechanical Rubber Goods; Sponge Rubber; Rubber Sundries; and Rainwear.

The code establishes a minimum of 35 cents per hour, with manufacturing employees in the Rainwear Division to be paid not less than 40 cents. Apprentices may be paid 28 cents per hour during a six-week apprenticeship. Minimums for salaried employees range from $12 per week in towns of less than 2,500 population, to $15 per week in cities over 500,000. Provision is made for equalizing rates of pay for men and women performing the same work, and for equitable adjustments of pay schedules of factory employees receiving more than the minimum.

Each of the nine divisions will have its own Divisional Code Authority, with the chairmen of these groups serving as members of the Code Authority for the entire industry. The General Manager of the Rubber Manufacturers Association, Inc., will act as Chairman of the Code Authority without voting power, and the NRA Ad-

Rubber Toy Manufacturers Under Playthings Code

Unlike other rubber manufacturing plants, companies making rubber balls, balloons and other rubber toys will not be affected by the new codes just adopted for the tire and rubber industries. These manufacturers come under the Code of Fair Competition for the Toys and Playthings Industry, which was signed by President Roosevelt on November 6.

For the purposes of code administration, this industry has been divided into 22 groups. The principal rubber products groups are the Balloon Division and the Rubber Ball Division.

ministrator may appoint not more than three additional non-voting members. A. L. Kress has also been assigned as government member of this board.

In transmitting the code to President Roosevelt, General Johnson pointed out that the sales value of the products of the industry had declined from $430,500,000 in 1929 to $175,000,000 in 1932, while the number of employees had been reduced from 80,550 to 51,360 in the same period. [*A copy of the complete rubber industry code will be furnished to any reader of* THE RUBBER AGE *requesting it. Just address the Editor at 250 West 57th St., N. Y. C.*]

OFFER BY GENERAL TIRE FOR INDIA IS REJECTED

The General Tire & Rubber Company lost in its effort to purchase the India Tire & Rubber Company for approximately $557,000 when three judges of the common pleas court at Akron turned down the offer as "inadequate" late last month. The company is continuing to operate under Paul C. Weick, receiver, pending any further decision.

Mr. Weick and W. G. Klauss, former president of India, are making efforts to reduce the finished tire inventory of the company from $400,000 to about $150,000, which they claim can be done without "dumping" tires on the market to the detriment of present India and other tire dealers. An attempt is being made to settle the claims of the British bondholders of the company on the basis of a 33 per cent cash payment.

WASTE DEALERS PLAN CONVENTION IN MARCH

Plans for the next convention of the National Association of Waste Material Dealers, Inc., were discussed at a meeting of the board of directors at the organization's headquarters in New York on December 18. The next convention, which will be the 21st annual meeting of the organization, will be held on March 19, 20 and 21. No definite place has yet been fixed, but New York and Atlantic City are under consideration.

A nominating committee was appointed to draw up a list of officers and directors for the next fiscal year. The report of the association's treasurer indicated that the organization has been able to maintain a sound financial position despite the additional burden in connection with its code activities and that the membership is steadily increasing.

A.S.T.M. in New Quarters

Headquarters of the American Society for Testing Materials have been moved from the Engineers' Club Building, Philadelphia, to more adequate offices in the Atlantic Building, 260 South Broad street in the same city. The new quarters include offices, reception room, members' lounge and a board room on the fifth floor of the building and space for the storage of publications and shipping purposes on the fourth floor.

Viles Elected President Of Rubber Association

At the annual meeting of the board of directors of the Rubber Manufacturers Association, Inc., on January 8, A. L. Viles, for many years General Manager of the Association, was elected President and General Manager. W. H. Lalley, Kelly-Springfield Tire Company, was made Chairman of the Board. Other officers named were R. H. Goebel, Secretary; H. B. Delapierre, Kelly-Springfield Tire Company, Treasurer; W. H. Blackwell, United States Rubber Company, Assistant Treasurer; and Charles Neave, General Counsel, all of whom were reelected. The offices of First Vice-President and Second Vice-President were abolished.

The executive committee elected for the ensuing year is made up of F. B. Davis, Jr., United States Rubber Company; G. B. Dryden, Dryden Rubber Company; A. F. Townsend, Raybestos-Manhattan, Inc.; C. Slusser, Goodyear Tire & Rubber Company; W. H. Lalley and A. L. Viles. The board of directors remains the same, with the exception that J. Penfield Seiberling, Seiberling Rubber Company, succeeds W. S. Wolfe, of the same company.

In accordance with a decision previously made, the annual dinner of the Association, usually held at New York during Automobile Show week, was eliminated this year.

VULTEX CHEMICAL CO. ENLARGES ITS PLANT

Following the recent purchase by the Vultex Chemical Company of the land and buildings formerly owned by the Midvale Steel Company at 666 Main Street, Cambridge, Mass., an addition has been made to the buildings and the remodeled plant is now ready for occupancy. The new addition will substantially increase the firm's manufacturing and storage facilities for its production of Vultex and latex compounds.

The parcel purchased contains 51,000 square feet of land served by a spur track of the Boston & Albany Railroad. The Vultex Corporation of America will also maintain an office and an enlarged research and development staff in the new plant.

LEE INCREASES PROFIT; DECLARES A DIVIDEND

The Lee Rubber & Tire Corporation reports net earnings for the year ended October 31, 1933, at $260,607 after interest charges, taxes and depreciation, comparing with income of $150,032 in the preceding year. Net sales for the year were lower, however, at $5,150,515 as against $6,411,099 in the year ended October 31, 1932.

Directors of the Lee Rubber & Tire Corporation on January 4 declared a dividend of 20 cents a share on the capital stock, payable February 1 to stockholders of record as of January 15. This is the first dividend paid by the company since 1923.

U. S. TIRE PATENTS HELD INFRINGED BY FIRESTONE

Four important tire manufacturing patents owned by the United States Rubber Company were ruled to be valid and infringed upon by the Firestone Tire & Rubber Company in a decision handed down by Judge Paul Jones in the Federal District Court at Cleveland on December 16. The judgment would involve payment by the defendant of royalties and damages variously estimated to as high as $30,000,000, and the Firestone company has filed notice of its intention to appeal the case.

The Hopkinson patent, which covers the flat band method of building and shaping tires, was held valid and infringed, as was the Gammeter patent covering vacuum and fluid pressure shaping of the casing and the Abbott patent covering the "U"-box tire former apparatus. Judge Jones also held valid and infringed the Lough patent, covering a rubberized breaker strip applied to the pulley-band before expansion and so positioned by angular rearrangement of its threads as to accommodate itself to the enlargement upon expansion to the casing to tire form. Two other patents were found to be valid but not infringed, while a Hopkinson reissue was held invalid.

The suit was originally begun by the United States Rubber Company in January, 1931. In January, 1933, C. D. Frebolin, special master for the United States District Court of Cleveland, reported in favor of Firestone with important exceptions, but in a later report in May, 1933, he reversed himself in several particulars and found most of the patents valid and infringed by Firestone.

GOODYEAR HEARING IS SET FOR JANUARY 15

First hearings in the Federal Trade Commission complaint against the Goodyear Tire & Rubber Company are to begin at Akron on January 15. John W. Bennett has been named trial examiner and P. B. Morehouse, attorney for the commission, will prosecute the charges, which allege that the company's contract with Sears, Roebuck & Company involves unfair trade practices and "discriminatory prices."

Goodyear has admitted that its contract calls for the manufacture of tires under brands owned and controlled by Sears, Roebuck & Company on a cost plus basis from October 5, 1931, until December 31, 1942. It denies, however, that the contract permits any discrimination in price or tends to create a monopoly in violation of the Clayton Act.

It is reported that P. W. Litchfield, president of the Goodyear Tire & Rubber Company, will be among the first witnesses to be called.

W. T. L. TEN BROECK, of the research department of the Goodyear Tire & Rubber Company, planned to sail about the middle of January for the Far East. His headquarters will be at Goodyear's Dolok Merangir rubber estate, where he will be engaged in research work.

Leaders of the Rubber Industry Look With Optimism to Developments in 1934

Company Heads Foresee Improved Conditions as Result of NRA Codes — Greater Business Seen in Original Equipment for Tire Manufacturers

EXECUTIVES of leading rubber manufacturing companies are unanimous in sounding a definite note of optimism for the present year insofar as their own industry is concerned. The new attempt at cooperation under the NRA codes is cited as the principal reason for confidence, while the trend toward higher prices and the improved outlook in the original equipment tire field give distinct prospect for better conditions.

Support of President Roosevelt is the keynote of the New Year message of William O'Neil, president of the General Tire & Rubber Company, who declares that business today is definitely better in practically all parts of the world. "During 1931 and most of 1932," he says, "our company suffered consistently increasing credit losses. However, during the past year and a half, with the single exception of one month, we have collected more money each month than our total sales. This indicates that our dealers are doing more satisfactory business.

"Costs are rising; wages are rising; values are rising. There probably will be some interruptions to the trend toward better times, but they will be merely interruptions.

"There is a definite trend upward today. When the value of merchandise increases steadily, it encourages dealers. It gives them new hope and renewed faith in their own ability to obtain additional orders. It makes them go after business more enthusiastically. This improved morale in itself makes for better business.

Codes Improve Conditions

"There are some troubles with the NRA codes but, as a whole, they are doing better than any of the pessimists care to admit. The cotton code is helping. The steel men like their code. Automobile men have renewed theirs. Certainly, the rubber code will not be harmful. Let's back the President."

In a similar vein, J. D. Tew, president, the B. F. Goodrich Company, asserts, "The business outlook for the rubber industry in 1934 is dependent to a considerable degree on the prompt establishment of the new industry code of fair practices. If this code is generally effective in the near future, the prospect for somewhat improved business in many branches of the industry is indicated.

"The industry reflected the changed economic conditions of the last three quarters of 1933, the upturn being marked by somewhat more stable conditions, increased employment, higher wages and slightly higher and more equitable prices. Provided the industry puts its house in order early in 1934, anticipated continued improvement in general business throughout the United States should bring a more satisfactory status for most rubber companies at the close of 1934."

Harvey S. Firestone, Sr., president, Firestone Tire & Rubber Company, feels sure that the tire code will greatly benefit the industry. "With the establishment of fair practices in the tire business, I'm sure we'll have a good year," he says.

"Hope for improvement," according to P. W. Litchfield, president, Goodyear Tire & Rubber Company, "is, of course, contingent upon the ability of the government to preserve its credit and at the same time carry forward its relief program.

Predicts More New Car Sales

"The tire industry has better prospects for 1934. New car sales are likely to improve and this would call for more tires for original equipment. The new code for the rubber industry gives hope that we will find a measure of relief from the evils of rampant price cutting and other destructive practices of the past. Then, too, the expected improvement in general business conditions will be reflected in the tire industry."

"I feel greatly encouraged over the outlook," says Frank Millhoff, vice-president of the Master Tire Corporation, "and reports from our dealers indicate that we are going to start the year right, at least."

Among the smaller manufacturers, R. J. Funkhouser, president, O'Sullivan Rubber Company, declares his belief that the NRA has corrected price cutting and unfair competition. "For the first time since the effects of the depression," he says, "the industry now can look to the future with confidence."

J. W. O'Meara, an official of the R. L. Polk Company and formerly of the B. F. Goodrich Company, ventured the definite forecast that new car production would reach 3,000,000, which would mean that 15,000,000 original equipment tires would be made.

Readers desiring a copy of the Rubber Manufacturing Industry Code may obtain this by addressing the Editor of THE RUBBER AGE.

FAULTLESS RUBBER TO RETIRE COMMON SHARES

The Faultless Rubber Company, manufacturer of rubber specialties at Ashland, O., will retire 10 per cent of its 72,722 outstanding shares of common stock, according to an announcement made by the board of directors on January 4. The company will employ its surplus assets for the purpose of purchasing and retiring 7,272 shares of its stock at a price of $26 a share, stockholders being limited to turning in 10 per cent of their own holdings unless the quota set is not reached.

Cost of purchasing the stock would be $189,072, and the company would save $14,544 annually in dividend disbursements. The company's balance sheet as of December 15 showed $302,631 cash and $249,494 in United States government bonds while total assets were $840,011. Current liabilities totaled only $63,814 including the January 2 dividend amounting to $36,361. Faultless in the five months ended November 30 earned about $1 a share.

OCTOBER TIRE SHIPMENTS 41% HIGHER THAN 1932

Shipments of pneumatic casings for the month of October amounted to 2,536,971 casings, a decrease of 27.6% below September but 41.0% above October, 1932, according to statistics released by the Rubber Manufacturers Association, Inc.

Production of pneumatic casings for October was 3,428,658 units, a decrease of 14.3% under September but was 33.5% above October 1932.

Pneumatic casings in the hands of manufacturers October 31 amounted to 8,461,735 units, an increase of 11.4% as compared with September 30 stocks and 23.1% above stocks October 31, 1932.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	*Production*	*Inventory*
Oct., 1933	2,536,971	3,428,658	8,461,735
Sept., 1933	3,503,365	3,099,239	7,594,506
Oct., 1932	1,799,136	2,568,641	6,875,980

Rubber Workers Organize

Some progress has been reported in the attempt to unionize rubber manufacturing plants, individual "locals" being formed in each of the more important company units. Plans are under way for an international convention of rubber unions to be held in Akron January 20 for the purpose of establishing a permanent countrywide organization.

Henderson May Resume

The Chamber of Commerce of Bucyrus, O., is backing a movement to secure the location of the Henderson Tire & Rubber Company in that town. Until its recent receivership, the Henderson company operated a plant at Columbus, O., and it is planned to move its machinery from that plant to Bucyrus if negotiations are successfully completed.

NEW ENGLAND NEWS

Prospects of the rubber industry in Western Massachusetts for 1934 are brighter than in several years, although manufacturing volume reached bottom levels during 1933. Demand for automobile tires, sporting goods and elastic thread is showing an increase which is expected to gain genuine impetus before spring.

The Fisk Rubber Corp., Chicopee Falls, has gone through the throes of reorganization and labor trouble during the past year, with alternate spurts and slumps in production. The corporation is now in position to take advantage of any marked rise in the demand for tires.

A. G. Spalding & Brothers, sporting goods manufacturers operating plants in Chicopee and Willimansett, showed a volume of less than $10,000,000 in 1933, but executives anticipate a definite upturn this year, according to Milton B. Reach. The shorter work week now being adopted generally, with resulting extra leisure for the populace, is expected to cause a sharp jump in the demand for sporting goods. Golf and tennis balls have been among the items showing the best sustained volume sales in 1933.

The United Elastic Corp., Easthampton, has operated at about 50 per cent of capacity throughout the year, with a 70 per cent force of workers. Increases in cost of materials, ranging up to 100 per cent in some instances, has somewhat confused the outlook, but executives regard spring prospects as fair.

B. F. Perkins & Sons, Holyoke, manufacturers of embossing rolls, gauges and other equipment used in the rubber industry, is reported as viewing the future with confidence.

Satisfactory settlement of the strike of 135 employees of The Whitney-Blake Co., New Haven, Conn., manufacturer of insulated wire, was reported December 18. While the taking of inventory prevented immediate reemployment of all the strikers, it was believed that all would be back at work the first week in January. The company agreed to comply with the bargaining provisions of the National Recovery Act and the strikers have organized a Wire Workers' Local as a unit of the A. F. of L.

About 200 persons attended a Christmas party staged December 23 for employees of the Derby and Shelton, Conn., plants of the Sponge Rubber Products Co. Grab-bag gifts and entertainment were featured, preceded by a turkey dinner. Speakers included F. M. Daley, president; William R. Todd, secretary-treasurer, and Lowell D. Smith, vice-president. The party was held in the Shelton plant.

Distinct improvement is reported in prospects of the Rubber Craft Co., New Haven, Conn., now operating under a federal receivership. The concern has received a number of new contracts and may be able to pay off all creditors, Judge Carroll C. Hincks of U. S. District Court was advised recently.

Jenkins Bros., Bridgeport, Conn., staged a Christmas party for office employees at the plant December 21, carrying out its annual custom.

Arthur Scrivenor, formerly connected with Batten, Barton, Durstine & Osborn, New York advertising agency, has succeeded Gale Shedd, Jr., as advertising manager of the Seamless Rubber Co., New Haven, Conn., manufacturers of drug sundries and sporting goods.

An increase in the number of inquiries and small orders, indicating better feeling in the trade generally, is reported by the H. O. Canfield Co., Bridgeport, Conn., manufacturers of plumbers' supplies and rubber specialties of all types.

Arthur Perry Smith, president of the R. H. Smith Mfg. Co., 369 Worthington street, Springfield, Mass., died December 31 at his home in Springfield. The Smith company specializes in the manufacture of flexible rubber printing plates and rubber printing rolls and has been regarded as a pioneer in the field. Rubber plates made by the concern are now widely used in the commercial printing industry, being especially adapted for printing on rough surfaces, such as wave-finish covers and bags, as well as on bond papers and Cellophane bags and wrappings. The rolls are designed for printing fancy patterns in a continuous process, as on paper napkins. The plates and rolls have been marketed through a subsidiary, the Re-Zilio Printing Plate Co. Mr. Smith was a native of Ithaca, N. Y., but had resided in Springfield for 43 years.

GOODYEAR INTRODUCES NEW TYPE OF CONDUIT

A new type of conduit, designed to meet the most rigid requirements of underground electrical service, is the latest product announced by the Goodyear Tire & Rubber Co. Developed after several years of exhaustive research and experimentation, the new product is said to have a number of outstanding advantages over existing conduit.

Due to its high resistance to water absorption and its definite fire resistance, Goodyear conduit will maintain excellent mechanical characteristics under all conditions. In addition it has unusually high impact and crushing strengths even at extremely low temperatures, while in tests at extremely high temperatures, the duct does not exude oils or impregnating compounds, eliminating the possibility of cables becoming imbedded in the compound of the duct at extreme overload temperatures.

It is highly resistant to the passage of electric current even under moist conditions, minimizing the possibility of damage to cable sheaths between manholes due to electrolysis; and because of its lack of surface oxidation, does not deteriorate in any degree when exposed to the elements.

NOVEMBER CONSUMPTION HIGHER THAN IN 1932

Consumption of crude rubber by manufacturers in the United States for November amounted to 29,162 long tons, which compares with 31,906 long tons for October this year, and represents a decrease of 8.6% under October but was 25.5% over November a year ago, according to statistics released by the Rubber Manufacturers Association. Consumption for November, 1932, was reported to be 23,231 long tons. Consumption for first eleven months 1933 amounted to 376,601 long tons as compared with 313,985 long tons for same period 1932.

Imports of crude rubber for November were 42,448 long tons, a decrease of 1.3% under October but was 56.8% above November, 1932.

This Association estimates total domestic stocks of crude rubber on hand November 30 at 353,852 long tons, which compares with October 31 stocks of 343,579 long tons. November stocks show an increase of 3.0% as compared with October of this year, but were 1.8% below stocks of November 30, 1932.

The participants in the statistical compilation report 57,140 long tons of crude rubber afloat for the United States ports on November 30, compared with 58,568 long tons afloat on October 31, this year, and 40,879 long tons afloat on November 30, 1932.

November reclaimed rubber consumption is estimated to be 6,335 long tons, production 9,063 long tons, stocks on hand November 30, 19,170 long tons.

Vanderbilt News Index

The R. T. Vanderbilt Company, 230 Park Avenue, New York, has issued a comprehensive index to Volumes 1, 2 and 3 of the *Vanderbilt News*, covering all issues of this publication from its inception in 1931 to the November-December, 1933, number. The index, which was published in compliance with insistent requests from readers, is in booklet form and may be conveniently inserted with the *News* issues in a loose-leaf binder.

Standard Tire Plant Sold

The Wilwin chair factory at Cleveland has purchased the former Standard Tire Co. plant at Willoughby, Ohio, from Percy Wenham, it was announced recently. The tire plant has been vacant for four years. It was purchased by Wenham about three years ago.

Sears Resumes Third Line

To meet competitive conditions, Sears, Roebuck & Company, Chicago mail order house, are again offering a "third-line" automobile tire after having dropped it in their fall and winter catalog. The restored line is known as the Greater Crusader, and trade-in allowances will apply on these tires as well as on the All-States and Super All-States.

PERSONALS

CHANGES ARE MADE IN GOODRICH ORGANIZATION

James J. Cochran, formerly assistant advertising manager of the tire division, B. F. Goodrich Company, has been named assistant to J. A. Hoban, manager of Goodrich Silvertown, Inc.

W. W. Gill has been appointed manager of the national accounts sales division of the truck and bus tire department. He succeeds the late C. H. Russell.

Walter J. Haecker has been named wholesale and retail credit manager for the Pittsburgh district of the B. F. Goodrich Rubber Company and the Pittsburgh Goodrich Silvertown, Inc. He succeeds Robert W. Nickels, who will become credit manager for the Cleveland district of the B. F. Goodrich Rubber Company.

W. H. Keplinger, formerly credit manager of the Philadelphia district of the B. F. Goodrich Rubber Company, will assume a similar position for the Seattle district of the company. He will be succeeded at Philadelphia by Carl D. Horst, Jr.

Starr Kealhofer has been appointed manager of the Goodrich Silvertown, Inc., store at Galveston, Tex.

FRANK G. BREYER, partner in the firm of Singmaster and Breyer, New York City, was recently appointed manager of the Lacquer Manufacturers Association. He is also serving as chairman of the Committee on Unemployment and Relief for Chemists and Chemical Engineers in the metropolitan area.

DR. WALDO SEMON, DR. B. S. GARVEY, JR. and R. A. MATHES, of the chemical research laboratories of the B. F. Goodrich Company, attended the semi-annual organic symposium of the American Chemical Society at Ithaca, N. Y., during the last week of December.

L. D. TOMPKINS, vice-president of U. S. Rubber Co., who was appointed NRA industrial advisor for the tire industry in handling codes several months ago, was elevated to the position of Special Assistant Administrator of NRA late last month, with special duties to be assigned by General Johnson.

F. V. LARKIN, formerly with R. & H., recently joined the technical sales staff of Barrett Co., manufacturers of softeners, dispersing agents, plasticizers, etc., covering the Ohio rubber industry, with headquarters in Cleveland. Mr. Larkin augments the work of A. B. COWDERY, the Barrett representative who covers the entire rubber industry in the East and Middle West.

THOMAS H. CLARKE has been appointed assistant to W. C. Roberts, manager of the new battery department of The B. F. Goodrich Rubber Company, it was announced recently by J. A. HOBAN, general manager of Goodrich Silvertown, Inc., Akron, Ohio.

Rubber Globe Map

Under the name of the Globe Map of the World, the Pioneer Rubber Company, Willard, O., is introducing an inflatable globe

with a heavy cardboard base. Inflated to a diameter of eight inches, it is geographically accurate, contains a variety of educational features, and may be quickly fastened to its base. It is made of extra heavy construction from rubber latex and is printed in five colors.

EDWARD NEWTON, of the chemical research department of the B. F. Goodrich Company, discussed "The Electrodeposition of Rubber" before the Philadelphia Section of the American Electrochemical Society on December 15.

COMMODITY EXCHANGE TO ELECT GOVERNORS

The annual election of governors and nominating committees to represent the several membership groups of Commodity Exchange, Inc., will be held in the exchange's headquarters, 81 Broad Street, New York, on January 16. The candidates presented by the present nominating committee to represent the rubber group include Marcus Rothschild, Robert Badenhop, Charles Slaughter, Charles T. Wilson and William E. Bruyn. John L. Julian, formerly President of the old Rubber Exchange, has been named to represent the commission house group.

Candidates offered to represent the rubber group on the nominating committee for the ensuing year are David D. Haldane, Percy V. L. Bouton and Louis V. Keeler.

Litchfield Takes New Duties

P. W. Litchfield, president of the Goodyear Tire & Rubber Company, has been chosen president of the Goodyear Tire & Rubber Company of California to succeed the late John W. Mapel. He has also been named president of the Goodyear Textile Mills Company. Other officers elected are W. H. Fleming, general superintendent, who was named first vice-president of the two companies; H, J. Young, vice-president; J. L. Goddard, secretary, and J. S. Willaman, treasurer.

TRENTON NEWS

Tenrubber Mfg. Co., of 744 Broad Street, Newark, N. J., has been chartered at Trenton with $100,000 capital to manufacture all kinds of rubber goods. Alfred Rowe, of South Orange; May C. Smith, of Newark, and Anna E. Drake, of Irvington, are the incorporators.

The office force of the Joseph Stokes Rubber Co., Trenton, recently held their annual banquet and Christmas party. About 30 were in attendance.

The Rubber Manufacturers' Association of New Jersey held its annual meeting and dinner on December 11 at the Trenton Club. Thirty-five members were in attendance. John A. Lambert, of the Acme Rubber Mfg. Co., was re-elected president, while Lloyd R. Leaver, of the Thermoid Co., was chosen vice president to fill the term made vacant by the death of I. Ely Reed. Charles H. Stokes, Jr., of the Home Rubber Co., was re-elected secretary, and Horace B. Tobin, of the Woven Steel Hose & Rubber Co., was chosen treasurer.

The Essex Rubber Company, Trenton, is operating three shifts of employees again following a strike which interfered greatly with production. The strike was settled after Professor A. D. McCabe of Princeton University, Harold S. Maddock, receiver of the plant, and representatives of the NRA had conferred with the Rubberworkers' Union. Under the new agreement no worker will be barred from employment who is a member of the union; and length or service or seniority will be resorted to when it becomes necessary to lay off hands. The company is not required to retain in its employ any person convicted of a criminal charge involving a misdemeanor or more serious offense arising out of the strike.

L. Albert & Son, Trenton, dealers in second hand rubber manufacturing equipment, have been awarded $10,000 from the Ford Motor Co., of Michigan, by a jury in a North Jersey Circuit court after bringing suit for $25,000 on a breach of a 1930 contract. It is claimed that the Ford company was to deliver used machinery, but $15,000 of the claim was waived at the conclusion of the trial. The Albert firm won a $30,000 uncontested verdict in a similar Ford contract some time ago.

William R. Simpson, formerly connected with the Murray Rubber Company, Trenton, has resigned to accept a position as plant engineer of the United States Asbestos Co., of Manheim, Pa. Before leaving Trenton he was presented with a traveling bag by members of the American Legion.

Edward T. Comly, 54 years old, secretary of the Acme Rubber Mfg., Trenton, is recovering at his home, Morris Heights, Pa., from a fractured right leg and shock received when struck by an automobile. He was leaving the Trenton post office when he was run down.

GOODRICH SALES FORCE STARTS CONFERENCES

Nation-wide sales conferences of the B. F. Goodrich Company, for 1934 opened on January 5 and will continue through February 12, it is announced by S. B. Robertson, vice-president.

Meetings, attended by members of the field sales organization are being held in Cincinnati, O., Atlanta, Ga., Philadelphia, New York, Boston, Akron, O., Chicago, St. Louis, Kansas City, Mo., Dallas, Tex., Los Angeles, San Francisco, Seattle, Salt Lake City and Minneapolis.

One high-light of the conferences is the showing of a ten-reel talking picture devoted to the company's sales policies for the coming year, featuring the Golden Ply Safety Silvertown tire story, augmented by a stage presentation. During fadeouts at various intervals during the picture, the living actors will make their appearances and carry on the continuity.

Members of the Akron staff headed by Mr. Robertson and C. B. O'Connor, general tire sales manager, will conduct the conferences.

NUMBER OF INDUSTRIAL TIRES TO BE REDUCED

A proposed revision of simplified practice recommendation R103-29, Industrial Truck Tires, has just been mailed to all interests in the industry for their consideration and written approval, by the division of simplified practice of the Bureau of Standards.

The revised recommendation which was drafted by the industry's standing committee, reduces the thirty sizes held as standard in the 1929 program, to nineteen. Four new sizes have been added making a total of twenty-three sizes. This new program also covers sizes of tires for trailers.

The revised schedule will become effective one month after the announcement by the Department that the required degree of support has been received, and will then be promulgated as Simplified Practice Recommendation R103-33—Industrial Truck and Trailer Solid Tires.

Xmas Dollars at Firestone

Employees of the Firestone Tire & Rubber Company, from president to office boy, each received a new dollar bill for Christmas in accordance with an established custom of the firm. The Christmas dollar distribution for 1933 represented a total disbursement of $15,000, according to company officials.

Goodrich Speeds Xmas Pay

Several thousand employes of the B. F. Goodrich Company at Akron received their pay on Saturday, December 23, instead of on Tuesday, December 26, as a result of special overtime work by 45 workers of the company's payroll accounting department. It was necessary to obtain a special exception for this overtime work from the local NRA Compliance Board.

New Tentative Standards Approved

At a recent meeting of A.S.T.M. Committee E-10 on Standards several of the standing committees submitted new and revised tentative standards, and tentative revisions of standards. All of the proposals were accepted, Committee E-10 giving its approval to the publication of tentative revisions of standards. The list of new and revised tentative specifications and test methods and tentative revisions of standards contained a number of rubber standards as follows:

Tentative Methods of:

Testing Rubber Belting Used for Power Transmission (D 378-33 T) (D-11 on Rubber Products).

Test for Rubber Hose—Braided Construction (D 379-33 T) (D-11 on Rubber Products).

Test for Rubber Hose—Wrapped Construction (D 380-33 T) (D-11 on Rubber Products).

Revisions in Existing Tentative Specifications for:

Insulated Wire and Cable: 30 per cent Hevea Rubber (D 27-33 T) (D-11 on Rubber Products).

Insulated Wire and Cable: Performance Rubber Compound (D 353-33 T) (D-11 on Rubber Products).

These new tentative standards and revisions will be published in the 1933 A.S.T.M. *Proceedings* and in the 1933 Book of Tentative Standards and also in separate form.

Firestone Back on Air

The radio programs of the Firestone Tire & Rubber Company, were resumed on December 4 with Lawrence Tibbett and Richard Crooks, outstanding baritone and tenor respectively, alternating as the leading attractions. Harvey S. Firestone, Jr., will again give a series of short talks. William Daly will be the conductor of the Firestone orchestra. The program will be broadcast every Monday night at 8:30 P. M., E. S. T. over the NBC hook-up.

GOODRICH TRANSFERS TEXAS HEADQUARTERS

District headquarters of the B. F. Goodrich Company, formerly located in San Antonio, Tex., have been transferred to Houston and established at 2009-11 Capital Avenue in that city. P. E. Slack, district manager in San Antonio, remains in the same capacity in the new Houston district headquarters, and other members of the headquarters personnel also remain in their posts.

The new district headquarters will have control over Goodrich Silvertown, Inc., retail stores in Austin, Harlingen, Houston and San Antonio, and warehouses in Austin, Corpus Christi, Harlingen and San Antonio. The wholesale warehouse and Goodrich Silvertown, Inc., retail store in San Antonio remain undisturbed under the new arrangement.

Reason for the transfer, according to C. B. O'Connor, general sales manager of the tire division of the B. F. Goodrich, is that the new district headquarters will afford a more central location for sales efforts in the district territory.

757,150 TONS OF RUBBER TRADED IN SIX MONTHS

Reflecting the increasing public interest in commodities, trading on Commodity Exchange, Inc., New York, organized on May 1 as a consolidation of four exchanges with facilities for trading in futures of six commodities, during the first six months of its existence ended October 31 has been of record proportions, with total contracts traded in representing an aggregate dollar value of approximately $573,500,000. This is an average of $95,500,000 a month or $3,800,000 for each business day. During this same period, deliveries of the actual commodity on contract has represented a total value of $40,333,300, indicating the important position occupied by the Exchange among the markets of the world.

Crude rubber futures traded in totaled 757,150, compared with 271,810 for the entire year 1932, and were more than double world production during this six months period. During the month of July, a total of 263,090 tons were traded in, representing 96.8% of the entire 1932 total. Prices, which by May 1 had risen from the extreme lows of the previous summer, continued to advance. The December position, starting at 5.00 cents a pound on May 1, climbed to 11.60 cents by July 18. Subsequently, values declined to 6.91 cents on October 20 and closed on October 31 at 7.81 cents.

Harder Tennis Balls Authorized

Ten makes of tennis ball were authorized for the period January 1, 1934, to October 31, 1934, at the Lawn Tennis Association Council meeting held in London recently. As from January 1, 1934, the ball will be made in accordance with the new limits of compression approved at the annual general meeting of the International Lawn Tennis Federation, held on March 17, 1933. The measurements of compression will then be not less than .265 of an inch and not more than .290 of an inch, the result being a slightly harder ball than has been used for some years past.

New Scrap Rubber Firm

The Central Waste Material Company, 1816 North Main Street, St. Louis, Mo., has been organized by Samuel L. Bierman to carry on a general wholesale business specializing in the handling of rubber, metals and paper stock. A. Goodman, formerly president of the Levin-Goodman, Company, of St. Louis, is secretary and treasurer of the company.

Russian Synthetic Rubber Factory

Plans are already well advanced for the erection of a new synthetic rubber factory, for which a site has been laid out a few kilometres from Erivan, in Russia, according to *The Engineer*, London. Work has been started on the building of accommodation for the labor force and technical staff. The new factory will be conveniently located with respect to carbide and chromide plants, the sources of raw material required in the manufacture of synthetic rubber.

Obituaries

Everett Morss

Everett Morss, president of the Simplex Wire & Cable Company, died at the Massachusetts General Hospital, Boston, Mass., on December 27 after a short illness. He was sixty-eight years old.

Mr. Morss whose business connections took in banking, real estate, manufacturing, life insurance and public utilities, was born in Boston and educated at the English

Everett Morss

High School there and at the Massachusetts Institute of Technology, from which he was graduated in '85. He received the degree of Master of Arts from Tufts in '23.

During the World War he was a member of the priorities committee of the War Industries Board, and in 1918 was appointed chief of the brass section. He was a member of the executive committee of the corporation of M.I.T., serving in later years as treasurer. In 1921, he became president of the Boston Chamber of Commerce. He was a fellow of the American Institute of Electrical Engineers, a member of the American Society of Mechanical Engineers, and a member of Theta Xi fraternity.

Mr. Morss was president of the Franklin Foundation; a trustee of the Morss Real Estate Trust; director of the First National Bank, the Columbian National Life Insurance Company, Arthur D. Little, Inc., and the Old Colony Trust Company, all of Boston, and of the Rumford Chemical Works, Providence, R. I.

He was a member of the Metropolitan Club of Washington, of the University Union, Exchange, St. Joseph and Algonquin Clubs, of Boston; of the Engineers and Bankers Clubs of New York and the Country Club of Brookline, Mass.

Surviving are his wife, the former Miss Ethel Reed, of Boston, whom he married June 8, 1891; two sons, Everett and Noel Morss, and a daughter, Mrs. Constance Morss Fiske.

Patrick H. Mahoney

Patrick H. Mahoney, president and general manager of the Meade Rubber Company, Stoughton, Mass, died suddenly on December 3 in his 57th year. He joined the Meade organization as superintendent in 1916, becoming vicepresident in 1922 and president and general manager in 1930.

Howard W. McKee

Howard Wellington McKee, salesman for the Firestone Tire & Rubber Company, died at a Columbus, O., hospital on December 24. He was 45 years old and was president of the Clintonville Business Association.

J. Frank Dunbar

J. Frank Dunbar, well known in crude rubber circles for many years, died at his home in Brooklyn, N. Y., on December 17 in his 68th year. For the past three years he had been associated with his brother in the firm of F. W. Dunbar & Company, crude rubber dealers and importers, and during the 12 years from 1918 to 1930 he was an officer of the J. Frank Dunbar Company, crude rubber brokers. Prior to that time he had been connected with George A. Alden & Company, the Newton Rubber Works, and other firms.

Charles T. Grant

Charles T. Grant, former attorney for the Goodyear Tire & Rubber Company, died at the age of sixty-three on December 23 in Akron. He represented the Goodyear company in the stockholders' suits to upset the Dillon-Read financing which attracted nationwide attention several years ago.

GILLETTE WAREHOUSES SHIFTED TO COLUMBUS

The Gillette Rubber Company, Eau Claire, Wis., is establishing a new warehouse to serve the entire middlewestern and eastern territory at Columbus, O. The company's warehouse for this purpose was formerly located in Detroit, and it is said that the move will effect a great saving each year in freight rates and at the same time provide better distribution facilities.

The company has leased 20,000 square feet of floor space in the factory and warehouse building at 400 Dublin Avenue in Columbus. Its capacity will be 375 carloads of automobile and bicycle tires.

O'Sullivan Heel Output Up

Production of rubber heels by the O'Sullivan Rubber Company in its fiscal year ending September 3, 1933, exceeded 26,000,000 pairs. Shipments for the second half of the year increased 80 per cent over the corresponding period of 1932. Volume was the greatest for any six-month period since 1925. It is reported that the company's operations will show a profit for 1933 as against a deficit for 1932.

British Synthetic Rubber

Chemists of the British Dyestuffs Corporation, a subsidiary of Imperial Chemical Industries, Ltd., are reported as having developed a new synthetic rubber, impervious to both oils and heat, but possessing all the qualities of the natural product. The cost of producing the compound, about $1.67 a pound, will necessarily limit its use but this cost will be reduced if production is begun on a commercial basis.

Swan Rubber Increases Force

The Swan Rubber Company, Bucyrus, O., called back 40 additional workers at the end of last month, bringing its factory force up to a total of 110. The company is now working on two shifts of eight hours daily each.

A.S.T.M. Meeting Dates

Group meetings of the various committees of the American Society for Testing Materials will be held at the Wardman Park Hotel, Washington, D. C., from March 5 to 9, with the society's 1934 regional meeting being scheduled for March 7 at the same place. The annual meeting of the society will be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., from June 25 to 29.

INTERNATIONAL PULP CO., *41 Park Row, New York, N.Y.*

SOLE PRODUCERS OF PURE **ASBESTINE** SPECIALLY PREPARED FOR USE IN RUBBER

Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.

LIBERAL WORKING SAMPLE FURNISHED FREE

TO USE RUBBER PAVING IN VEHICULAR TUNNEL

At the annual meeting of Universal Rubber Paviors, Ltd., in Manchester, England, last month it was announced that 2,000 square yards of the company's Gaisman rubber paving blocks will be laid in the new Mersey vehicular tunnel. The company has also received the order for the laying of the whole of the traffic lines throughout the main and branch tunnels of this development. These traffic lines will be laid in the company's yellow rubber paving blocks, 6 by 12 inches in size, and the number of blocks used will exceed 24,000.

Further progress in the production and use of rubber for paving and similar purposes was announced, and it was stated that the sections of rubber paving blocks laid by the company in Huddersfield and New Bridge Street, London, during 1932 are giving excellent results.

NEW RUBBER COMPANY ORGANIZED IN MEXICO

A company of Mexican interests has been organized in Monterey, capital of the American border State of Nuevo Leon, according to the Journal of Commerce, to establish an automobile tire and rubber accessories factory, the Ministry of National Economy learns from its Monterey agent. This plant, which is expected to begin operations about January 1, has an initial capital of 60,000 pesos (approximately $18,000 U. S.), but the agent reports that when it gets under way its proprietors propose to increase the capitalization to around 500,000 pesos (about $140,000, U. S.).

This factory will cater to domestic markets in an endeavor to reduce heavy imports of automobile tires and rubber accessories, the report says.

Germany Tire Production Down

German tire production in 1932 declined 10 per cent in volume and 23 per cent in value compared with the preceding year's output, according to a report from Vice Consul F. A. Lane, Bremen, made public by the Commerce Department and appearing in the *Journal of Commerce*. Official figures show the value of tires manufactured in 1932 was 94,500,000 marks, compared with 123,500,000 marks in 1931. Preliminary figures indicate a marked acceleration in production during 1933, the report states.

Curtailed production of tires by German factories during 1932, it is pointed out, was due almost entirely to decreased manufacture of automobile tires. Production of bicycle tires showed an appreciable gain over 1931. During 1932 the report shows, there were eighteen plants in Germany employing 7,100 persons engaged in the manufacture of tires. Wages paid in this period amounted to approximately 13,000,000 marks. The largest German tire plants are located in Hanover where 60 per cent of Germany's tires and tubes are produced.

E. S. CONNER, recreational director of the Goodyear Tire & Rubber Company, was a guest speaker at the meeting of the Junior Chamber of Commerce, held at the Akron City Club on December 14.

Rubber Rain Capes and Berets

After first coming into prominence at the Century of Progress in Chicago, rubber rain capes are increasing their popularity and are now being sold widely through department stores and other outlets. The B. F. Goodrich Company, Akron, O., is manufacturing single-tone and two-tone capes for women in a 42-inch length and two-tone capes for misses and children in lengths of 36 and 27 inches, respectively. This company is also making two-tone rain berets, constructed with a hemmed opening. Both the capes and the berets are offered in a wide variety of colors and color combinations.

Canadian Goodyear Profit

According to C. H. Carlisle, president, operations of the Goodyear Tire & Rubber Company of Canada, Ltd., for 1933 showed considerable improvement over the previous year. Dividends for the year on both preferred and common stocks were earned, he states, and after making allowances for depreciation, taxes, bad debts, etc., there will be a sizeable balance to carry forward to surplus.

NEW GRANT SETTLED FOR ENGLISH RESEARCH UNIT

The terms for a new grant for the British Rubber Research Association have now been settled, and work at Croydon research station will be resumed immediately. The policy of the association will be more progressive than in the past, and organized so as to insure the maximum value to the members.

The articles of association provide that the Board of Management shall consist of twelve selected members, twelve ex-officio members, representing sectional interests, four co-opted members and two official representatives nominated by the Department of Scientific and Industrial Research; in addition, a president and vicepresident may be appointed. No firm or group of associated firms may have more than one representative among the twelve selected members of the Board.

JAPAN CONTINUES GAIN IN RUBBER MANUFACTURE

Expansion of rubber manufacturing has been one of the notable features in the recent industrial history of Japan, according to a report from the American Consulate General at Tokyo. An indication of the growth of such activities is revealed in the figures for imports of crude rubber and gutta percha since 1930. In that year total receipts amounted to less than 40,000 tons; in 1932 they had risen to 63,000 tons, while the total for the first eight months of the current year was 55,000 tons.

It is estimated that there are approximately 600 individual enterprises engaged in manufacturing rubber items in Japan. While the majority of these are comparatively small, there are about 40 which employ between 100 and 500 workers, and at least two which employ over 1,000 each. Total production of rubber goods in 1931, the last year for which official figures are available, had a value of 68,647,000 yen.

Japanese rubber products are sold in most of the world's markets, including the United States. In the eight months ended August total shipments were valued at 8,633,048 yen, compared with 6,546,954 yen and 8,368,989 yen, respectively for the two preceding years. Tires constitute the leading export item, followed by rubber shoes and toys.

British Goodyear Extending Plant

Work has begun at the Wolverhampton factory of the Goodyear Tire & Rubber Co. (Great Britain), Ltd., on extensions which will add 35,000 square feet to the floor space of the plant. These extensions will provide work for about 200 men, many of whom are at present engaged in levelling the ground and laying foundations for the new buildings. The additions are scheduled for completion by the end of 1933.

The new buildings will cover one floor only in accordance with the existing design of the factory, which is planned so that all additions can be made without in any way interfering with the smooth sequence of manufacturing processes.

Lastex Shirts in Britain

Men's shirts incorporating Lastex rubber yarn in their construction are being introduced throughout the United Kingdom this month with an intensive national advertising campaign. The new process is said to render the fabric flexible and uncreaseable.

Firestone Donates Park

The town of Columbiana, O., will have a new 40-acre play and recreation ground this year as the result of a gift from Harvey S. Firestone, Sr., chairman of the Firestone Tire & Rubber Company. The plot will be improved according to plans submitted by Mr. Firestone's own landscape artist. Columbiana is Mr. Firestone's birthplace.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

MANUAL ON PRESENTATION OF DATA—1933. Published by the American Society for Testing Materials, Philadelphia, Pa. Paper cover booklet. 45 pp. Price 50c. This manual was prepared to correlate and make available in convenient form some of the principles of efficient presentation of data. The manual discusses the applications of statistical methods to the problems of (1) condensing information contained in a set of observations and (2) presenting the essential information in a concise form more readily interpretable than the unorganized mass of original data. Attention is directed particularly to quantitative information on measureable characteristics of materials and manufactured products. In addition to pointing out the important measures or values which are especially useful for summarizing information contained in a set of observations, methods of computation, etc., are given. There are given in the manual critical comments on various methods used in presenting data, a discussion of what relevant information should accompany the data and recommendations for data presentation.

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LIST OF MEMBERS, September 1, 1933. Institution of the Rubber Industry, London, England. Paper cover pamphlet. 51 pp.

This pamphlet contains a List of Officers and Council for 1932-33, Totals and Abbreviations, and a List of Members. It also contains a list of subscribers to "I. R. I. Transactions."

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BROWN THERMOMETERS AND PRESSURE GAUGES. Catalog No. 6702. Issued by the Brown Instrument Co., Philadelphia, Pa. Paper cover. 80 pp.

This new catalog contains descriptions and illustrations of the new Brown Indicating, Recording and Controlling Thermometers and Pressure Gauges. All of the recent improvements in Brown Instruments are fully described.

•

OPERATORS HAND BOOK. Issued by The B. F. Goodrich Company, Akron, Ohio. 1933 edition. Paper cover booklet. 3⅝ x 5½ in. 33 pp.

This booklet contains information on truck and bus tires and tubes of interest to all operators, including tire specification charts, dual spacing charts, operating suggestions and weights of various materials. Listed this year are the new Goodrich tractor-grader pneumatics for tractors, graders, snow plows, mowers and road maintainers; the Zero Pressure tractor tire, and the new Goodrich cured-in tube valves.

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L. J. SCHOTT CO.
P. O. BOX 124, E. AKRON STAT.
AKRON - - - - OHIO

Buyers of Surplus and Obsolete Rubber Chemicals, Colors, Fabrics, &c.

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A. S. T. M. STANDARDS ON TEXTILE MATERIALS, September, 1933. Prepared by Committee D-13 on Textile Materials. Published by American Society for Testing Materials, Philadelphia, Pa. Price $1.00. Paper cover. 164 pp.

This publication contains all of the 30 standard and tentative specifications, methods of testing and definitions pertaining to textile materials, which have been issued by the American Society for Testing Materials, through the work of its Committee D-13 on Textile Materials. This is the first compilation of A. S. T. M. Standards covering these materials since 1930. Many new standards have been issued since the appearance of the earlier publication so the present edition should be of much convenience to those dealing with textile materials. Several of the specifications and test methods previously issued as tentative were adopted as standard this year. Specifications for a number of materials were revised this year. The latest revisions (either adopted or to be tentative for a year) are given. Proposed revisions in the standard methods of testing woven textile fabrics are detailed. Revisions (issued previous to this year) in the specifications for textile testing machines and for asbestos yarns were adopted this year and are given in the book. In addition to the standards, the book includes a psychrometric relative humidity table which combines accuracy and convenience; photomicrographs of common textile fibers; and a proposed potassium dichromate oxidation method for the determination of total iron in asbestos textiles.

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UNIFORM COST ACTIVITIES IN TRADE AND INDUSTRY, Report issued by Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City. 48 pp. and cover.

As a means of combating the unsatisfactory conditions that have arisen out of uncontrolled price competition and excessive price-cutting, many business men are giving serious consideration to the need for some plan of uniform cost-accounting and reporting specifically adapted to the problems, of their trade and industry. The above report on the subject is the result of a review of the uniform cost experiences of more than 76 Trade Associations and sets forth, as well, the opinions and ideas of a number of responsible executives in a wide variety of industries.

Procedures entailed in administering uniform cost activities and methods of preparing uniform cost accounting manuals are discussed. A limited number of copies of the report are available for readers of this publication. Requests may be addressed direct to Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison Avenue, New York City.

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GOODRICH AUTOMOTIVE ACCESSORIES. Issued by The B. F. Goodrich Company, Akron, Ohio. 1933 catalogue. 8½ x 11 in., 64 pp.

This catalogue contains information valuable to anyone merchandising automotive accessories, both in picture form and in data and specification sheets and tables. The fan belt section carries thoroughly illustrated "Instructions for Installing Fan Belts" which makes it possible for operators to install belts in the minimum of time, and in a way that guarantees satisfaction of the customer. Every known make and model automobile, truck, bus and tractor, including the 1933 models is listed in the section on fan belt and radiator hose, with the name of the vehicle, the model number, year, and size of fan belt and radiator hose given. All types of hose used in the automotive service station are pictured and described, as well as automobile floor mats, running board matting, and every article used in maintenance and repair of automotive tires and tubes.

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THE BALANCE-PLASTOMETER, article by J. Hoekstra, Netherlands Government Rubber Institute, Delft, in *Physics*, England, August, 1933.

This article describes a simple instrument for measuring plasticity and recovery of soft materials. The principle of the instrument is as follows: A bar is fixed to the long arm of a balance with unequal arms, the vertical displacement of this bar, which rests on a specimen of the material to be investigated, is magnified fifty times and read on a scale. The specimen rests on a second bar with a known cross section. The first named bar can be loaded with a known weight, and this weight can be removed at will.

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REGULATIONS FOR THE LICENTIATESHIP, issued by the Institution of the Rubber Industry, London, England. Paper cover pamphlet; 10 pp. For free distribution.

This pamphlet contains the following: Objects for which the Licentiateship was Instituted; Regulations for the Licentiateship in Science; Regulations for the Licentiateship in General Rubber Technology; General Regulations; Fees.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, JANUARY 9, 1934

Crude Rubber

CRUDE rubber has continued its fractional advances of the past few months with an average price in the outside market of 8.87 cents for December as compared with 8.66 cents in November. The average price for the year has figured out to 5.96 cents as compared to 3.49 cents for 1932. Spot rubber on the Exchange reached a high of 9 cents on December 29 with a low of 8.50 on the 9th. Ten-cent rubber was quoted for June and July during the first week of December and again on the last two trading days of the year when November and December were quoted over the ten-cent mark. Trading in general has been dull, having been influenced somewhat by the holidays. Nothing of a definite nature has been forthcoming on restriction, but the market has been sensitive to any scrap of information on this situation. Quotations follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.08¾
January	—	@	.08¾
Feb.-March	—	@	.08⅞
First Latex, crepe spot	—	@	.10¼
Amber Crepe, No. 2	—	@	.06½
Amber Crepe, No. 3	—	@	.06⅜
Amber Crepe, No. 4	—	@	.06¼
Brown Crepe, clean thin	—	@	.06½
Brown Crepe, rolled	—	@	.04⅞

Latex—

Liquid Latex, per gal.	.72	@	—

Paras—

Up River, fine	—	@	.08¾
Acre Bolivian, fine	—	@	.09

Balata—

Block, Ciudad	—	@	.25

LONDON MARKET

Standard Smoked Sheets—Buyers—Jan. 9

January	—	@	4 7/32d
Apr.-June	—	@	4 5/16d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—Jan. 9

January	—	@	3 23/32d
Apr.-June	—	@	3 25/32d

Reclaimed Rubber

Reclaimers enjoyed an active December with a fair movement of stocks to rubber manufacturers. Prospects for 1934 are reported bright, especially in view of the reports of a banner year in tire production. There are possibilities of a price rise in reclaims during the next quarter in keeping with the tendency in quotations of crude. Restriction talk is dormant at the moment, but some definite action is expected shortly. Quotations follow:

High Tensile

High Tensile Red, lb.	.06½	@	.06¾

Shoe

Unwashed, lb.	.06½	@	.06¾

Tube

No. 1 (Floating), lb.	.11	@	—
No. 2 (Compounded), lb.	.06¼	@	.06½

Tires

Black, lb.	.04¾	@	.05
Black, selected tires, lb.	.05	@	.05¼
Dark Gray, lb.	.05¾	@	.06
White, lb.	.07¼	@	.07½
Truck, Heavy Gravity, lb.	.05¼	@	.05½
Truck, Light Gravity, lb.	.05¾	@	.06

Miscellaneous

Mechanical blends, lb.	.04	@	.04¼

Scrap Rubber

A favorable December was reported by scrap dealers with fair activity so far this month. Collections are about average with little change in prices except auto tire peelings, truck tires and No. 2 inner tubes, which advanced fractionally. Current quotations follow:

(Prices to Consumers)

Auto tire peelings, ton	19.00	@	21.00
Mixed auto, ton	10.00	@	11.00
Clean solid truck tires, ton	32.00	@	34.50
Boots and shoes, ton	25.00	@	27.00
Arctics, untrimmed, ton	18.00	@	20.00
Inner tubes, No. 1, lb.	.05	@	.05¼
Inner tubes, No. 2, lb.	.02¾	@	.03
Inner tubes, Red, lb.	.02⅜	@	.02½

Cotton

The average price of spot middling in New York during December was 10.17 cents compared to 10.04 in November. The average for 1933 was 8.63 as against 6.41 for 1932. Contracts on the Exchange have been improving in the past few weeks, quotations in general rising with today's prices the highest since last September. Turnover also has been large, the Agricultural Adjustment Administration converting 200,000 bales of December and January cotton into spot. In the meantime, the AAA had started its acreage reduction program which was favorably received by growers. Consumer demand continues active. Quotations on the New York Cotton Exchange for Middling Upland follow:

	Dec. 9	January 9		
	Close	High	Low	Close
January	——	10.69	10.61	10.69
March	10.12	10.77	10.67	10.76
May	10.27	10.93	10.82	10.92

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/4/3, lb.	.42	@	—
Peeler, carded, 23/5/3, lb.	.41	@	—
Peeler, carded, 13/3/3, lb.	.38	@	—
Peeler, carded, 15/3/3, lb.	.39	@	—
Egyptian, carded, 23/5/3, lb.	.51½	@	—
Egyptian, combed, 23/5/3, lb.	.53½	@	—

CHAFERS

Carded, American, 1 1/16", lb.	.37	@	.38
Carded, American, 1", lb.	.31½	@	.32

LENO BREAKER

Carded, American, 1 1/16", lb.	.37	@	.38
Carded, American, 1", lb.	.31½	@	.32

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50 lb.	—	@	.05½
40x40	36 in.	6.15 lb.	—	@	.04⅞
40x36	36 in.	6.50 lb.	—	@	.04⅝
48x48	40 in.	2.50 lb.	.10⅛	@	.10¼
48x48	40 in.	2.85 lb.	.08¾	@	.08⅞
64x68	40 in.	3.15 lb.	—	@	.10
56x60	40 in.	3.60 lb.	—	@	.09
48x44	40 in.	3.75 lb.	.07⅜	@	.07½
44x40	40 in.	4.25 lb.	.06½	@	.06⅝

Ducks

Enameling, lb.	.32	@	.33
Belting and Hose, lb.	.30	@	—
Single filling, A grade, lb.	.16	@	.16½
Double filling, lb.	.17	@	.17½

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 Tons

FROM DECEMBER 10 TO JANUARY 9

Date	Spot	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Sales
Dec. 10															
11	8.81	8.72	8.84	8.94	9.05	9.17	9.39	9.40	9.51	9.60	9.70	9.80	9.90	——	308
12	8.58	8.45	8.60	8.72	8.84	8.95	9.07	9.17	9.28	9.38	9.49	9.59	9.69	——	242
13	8.50	8.44	8.53	8.64	8.76	8.88	9.00	9.09	9.19	9.29	9.39	9.49	9.59	——	245
14	8.75	8.60	8.70	8.82	8.97	9.08	9.21	9.31	9.42	9.52	9.62	9.72	9.82	——	185
15	8.80	8.70	8.80	8.92	9.05	9.16	9.28	9.38	9.49	9.59	9.65	9.79	9.89	——	199
16	8.69	8.55	8.70	8.84	8.98	9.09	9.20	9.30	9.41	9.51	9.61	9.71	9.81	——	79
17	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
18	8.62	8.62	8.70	8.84	8.95	9.07	9.26	9.36	9.46	9.50	9.60	9.70	9.80	——	273
19	8.70	8.65	8.75	8.86	8.99	9.11	9.23	9.35	9.45	9.55	9.65	9.75	9.85	——	129
20	8.66	8.60	8.70	8.80	8.90	9.03	9.16	9.27	9.38	9.48	9.59	9.69	9.79	——	124
21	8.63	8.62	8.64	8.75	8.86	8.98	9.10	9.20	9.30	9.40	9.50	9.66	9.70	——	218
22	8.88	8.85	8.88	9.00	9.13	9.24	9.35	9.45	9.56	9.67	9.78	9.88	9.98	——	442
23	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
24	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
25	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
26	8.84	8.85	8.85	8.95	9.05	9.17	9.29	9.41	9.54	9.64	9.75	9.85	9.95	——	117
27	8.88	8.85	8.85	8.96	9.07	9.20	9.34	9.46	9.58	9.70	9.82	9.88	9.97	——	176
28	8.95	8.85	8.85	8.98	9.12	9.24	9.37	9.49	9.62	9.73	9.84	9.94	10.04	——	263
29	9.00	——	8.88	9.00	9.14	9.25	9.40	9.51	9.65	9.76	9.88	9.98	10.08	——	412
30	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
31	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
Jan. 1	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
2	9.00	——	8.90	9.03	9.17	9.28	9.41	9.52	9.64	9.75	9.87	9.95	10.04	10.14	275
3	8.88	——	8.85	8.97	9.09	9.20	9.31	9.43	9.56	9.67	9.79	9.89	9.99	10.09	193
4	9.00	——	8.92	9.03	9.15	9.27	9.39	9.49	9.60	9.72	9.84	9.96	10.07	10.19	214
5	9.00	——	8.88	8.98	9.09	9.19	9.31	9.40	9.50	9.62	9.75	9.85	9.95	10.05	153
6	8.88	——	8.88	8.98	9.07	9.18	9.30	9.40	9.50	9.62	9.75	9.85	9.95	10.05	51
7	——	——	——	——	——	——	——	——	——	——	——	——	——	——	——
8	8.75	——	8.75	8.85	8.95	9.06	9.17	9.28	9.39	9.49	9.59	9.69	9.79	9.89	142
9	8.75	——	8.76	8.86	8.96	9.07	9.18	9.29	9.40	9.51	9.62	9.72	9.82	9.92	74

Rubber CHEMICAL Markets

NEW YORK, January 10, 1934

ACCELERATORS

Organic			
A-1	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.43
Diphenylguanidine	lb.	.33 @	.34
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsol X	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
R-2 Base	lb.	4.55 @	5.00
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.20 @	.23
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.05¾ @	—
Magnesia, calcined, heavy	cwt.	4.00 @	4.50

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.36 @	.37
Ultramarine	lb.	.06 @	.10
Browns			
Sienna, Italian	lb.	.04 @	.08
Umber, Turkey	lb.	.04 @	.06
Greens			
Chrome, light	lb.	.23 @	.26
medium	lb.	.26 @	.28
dark	lb.	.28 @	.33
Chromium Oxide, bbl.	lb.	.23 @	.27
Reds			
Antimony			
crimson, 15/7	lb.	.40 @	—
sulfur, free	lb.	.48 @	.52
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Lithopone, Albalith	lb.	.04½ @	.04¾
Lithopone, Azolith	lb.	.04½ @	.04¾
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
XX Zinc Sulphide, bbls.	lb.	.11 @	.11¾
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾ @	.06
ZZ (leaded)	lb.	.05½ @	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾ @	.06
Special	lb.	.05¾ @	.06
XX Red	lb.	.05¾ @	.06
XX	lb.	.05¾ @	.06
XX Green	lb.	.05¾ @	.06
Leaded Brand, Standard	lb.	.05½ @	.05¾
Sterling	lb.	.05½ @	.05¾
Superior	lb.	.05½ @	.05¾
Lehigh	lb.	.05¼ @	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09½ @	.09¾
Blue label	lb.	.08½ @	.08½
Red label	lb.	.07 @	.07¼
St. Joe, black label	lb.	.05¾ @	.06
green label	lb.	.05¾ @	.06
red label	lb.	.05¾ @	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾ @	.06
Anaconda, selected lead free	lb.	.06¼ @	.06½
Florence White seal, bbls.	lb.	— @	.10⅝
Green seal	lb.	.09⅜ @	.09⅝
Red seal	lb.	.08⅜ @	.08⅝
Yellows			
Chrome	lb.	.16 @	.16½
Ocher, dom. med.	lb.	.01½ @	.02

BLACKS

Arrow "Aerfloted"	lb.	.0445 @	.0535
Arrow "Aerfloted" Specification	lb.	.0445 @	.0535
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.02¾ @	.07
uncompressed	lb.	.02¾ @	.07
"Certified," Cabot	lb.	.0445 @	.0535
Spherons	lb.	.02¾ @	—
"Disperso"	lb.	.0445 @	.0535
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0445 @	.0535
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.06 @	.08
"Micronex"	lb.	.0445 @	.0535
"Supreme"	lb.	.0445 @	.0535
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Cosmos"	lb.	.0445 @	.0535

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00 @	—
Barium carbonate (98-100%)	lb.	.05 @	—
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	10.00 @	18.00
Western prime white	ton	23.00 @	—
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	60.00 @	65.00
Carrara filier	lb.	.01¾ @	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	75.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	6.00 @	7.00
Aerfloted, Suprex	ton	6.50 @	8.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite		15.00 @	—
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.15 @	.22
medium white	lb.	.12 @	.14
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesia, carbonate	lb.	.06 @	.06¾
Mica	lb.	.04 @	—
Rottonstone (powdered)	ton	23.50 @	28.00
Soapstone, powdered	ton	16.00 @	18.00
Starch, powdered	cwt.	2.50 @	2.60
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.10
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.10½ @	—
Zinc Stearate	lb.	.20½ @	.21

MINERAL RUBBER

Genasco (factory)	ton	30.00 @	32.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	23.00 @	28.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.55 @	1.80
Tartaric, crystals	lb.	.23½ @	—
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.08 @	.12
Alkalies			
Caustic Soda, 76%	cwt.	2.55 @	—
Soda Ash, 58% C.L.	cwt.	1.20 @	1.35
Oils			
Corn, refined, bbls.	lb.	— @	.06¾
Cottonseed, crude	gal.	— @	.04
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¾ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¼ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.04⅜ @	—
Niger	lb.	.02¾ @	.03
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02½ @	—
Pigmentaroil	gal.	.13 @	.18
Pine, steam distilled	gal.	.59 @	.61
destructively distilled	gal.	.56 @	.58
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.07½ @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05½ @	.06
pine, 200 lb. gr. wt.	bbl.	6.00 @	—
Rosin, grade K, 290 lb.	bbl.	5.50 @	—
Pigmentar	gal.	.13 @	.18
Tar Retort, 50 gal.	bbl.	9.50 @	10.00
Solvents			
Acetone, pure	lb.	.10 @	—
Alcohol, denatured, No. 1 bbls.	gal.	.30½ @	.41½
Benzol, 90%	gal.	— @	.27
Carbon, bisulfide	lb.	.05 @	.06
Carbon, tetrachloride	lb.	.05¼ @	.06
Dipentene	gal.	.31 @	.41
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05 @	.06
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.55 @	—
wood	gal.	.50 @	—
destructively distilled	gal.	.45 @	—
Waxes			
Beeswax, white	lb.	.30 @	.32
Carnauba	lb.	.25 @	.26
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.05 @	.06
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02⅜ @	.03½
White crude scale 124/126	lb.	.02 @	.02½
Refined, 125/127, 138/140	lb.	.03 @	.07

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-A and Flectol-B	lb.	.54 @	.62
Neozone	lb.		
Oxypone	lb.	.68 @	.80
Resistox	lb.	.52 @	.65
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Dipex	lb.	.06 @	.08
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Zip	lb.	— @	—

SUBSTITUTES

Amberex	lb.	.13¾ @	—
Black	lb.	.06 @	.08
White	lb.	.07½ @	.12
Brown	lb.	.06½ @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½ @	.04
Sulfur flour.			
Refined, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1931:							
Sept.	38,494	4,970,324	5.76	1,362	187,431	6.14	37,132
Oct.	41,131	4,863,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,345	4,742,218	4.72	1,403	198,284	6.31	43,345
Dec.	53,536	5,610,120	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933:							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419
Feb.	22,603	1,554,086	3.12	1,244	102,129	3.73	21,359
Mar.	27,936	1,867,657	2.98	1,127	86,216	3.42	26,809
April	20,240	1,291,136	2.85	798	70,111	3.92	19,442
May	26,002	1,694,963	2.93	1,842	189,451	4.59	24,894
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex (1) Tons	Liquid Latex (1) Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	845,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1932:								
Dec.	—	—	22	5,209	276	36,298	632	79,250
1933:								
Jan.	—	—	33	7,815	357	40,586	841	100,900
Feb.	—	—	12	2,923	391	52,171	367	46,037
Mar.	—	—	45	11,963	437	56,262	539	55,731
April	—	—	7	2,054	210	26,856	794	80,794
May	—	—	35	9,869	463	55,560	734	71,008
June	—	—	759	1,514,296	466	61,229	604	66,827
July	—	—	238	76,141	638	79,049	618	85,636
Aug.	—	—	272	527,147	390	55,509	1,156	196,138
Sept.	—	—	65	30,738	761	149,296	1,343	267,516
Oct.	—	—	119	47,663	542	99,249	1,561	310,531
Nov.	—	—	31	11,252	626	125,160	1,239	282,065

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1926	1927	1928	1929	1930	1931	1932	1933
Jan.	32,196	31,518	34,403	43,002	36,194	28,557	29,648	21,661
Feb.	31,136	30,137	33,702	41,594	33,302	28,797	31,821	21,638
Mar.	32,936	36,141	35,688	44,736	35,540	32,788	29,505	18,047
Apr.	32,696	35,871	32,772	47,521	39,686	33,321	27,515	26,226
May	29,364	34,592	37,333	49,233	39,386	37,817	30,957	44,580
June	28,598	33,801	37,676	43,227	34,195	37,916	41,475	51,326
July	27,577	29,219	37,407	41,526	29,508	31,397	29,976	50,184
Aug.	34,533	33,460	42,927	38,274	30,850	27,586	23,721	44,939
Sept.	32,904	27,214	39,882	34,707	25,515	23,638	23,847	35,686
Oct.	29,936	26,790	40,857	34,800	27,516	22,277	22,286	31,906
Nov.	28,080	26,792	37,461	27,659	23,691	22,943	23,231	29,162
Dec.	26,293	25,492	31,232	25,531	21,687	21,409	18,015	—
Tot.	366,149	371,027	441,340	469,804	375,980	348,986	332,000	—

Figures on Quarterly Basis

Quarter	1926	1927	1928	1929	1930	1931	1932	1933
Jan./Mar.	94,301	99,216	103,558	128,565	101,610	89,652	85,309	64,211
Apr./June	87,109	103,242	103,500	139,292	112,229	107,755	92,643	121,445
July/Sept.	93,793	89,210	117,573	113,746	85,261	83,632	72,523	—
Oct./Dec.	83,212	80,860	117,597	84,872	72,020	65,645	64,145	—
Totals	358,415	372,528	442,227	466,475	371,120	346,684	314,620	—

Note—The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1923	74,766	69,534	22.7	.....
1924	80,079	76,072	22.4	.....
1925	132,930	137,105	35.6	13,203
1926	180,582	164,500	45.9	23,213
1927	189,144	178,471	47.6	24,980
1932:				
Jan.	8,660	8,971	30.3	22,682
Feb.	8,638	8,856	27.9	22,617
Mar.	8,521	7,887	26.7	23,910
Apr.	5,614	5,987	21.4	23,156
May	5,078	6,534	21.1	20,320
June	5,986	7,569	18.3	18,148
1933:				
Jan.	5,301	4,811	21.0	16,262
Feb.	4,578	4,363	20.2	16,570
Mar.	3,847	3,454	19.1	15,496
Apr.	4,617	4,407	16.8	14,370
May	8,366	7,770	17.4	13,734
June	10,591	9,674	18.8	13,231

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1928	208,516	223,000	50.4	24,785
1929	218,954	226,588	48.4	27,464
1930	157,967	153,497	40.8	22,000
1931	133,351	124,126	33.9	19,257
1932	75,608	77,504	23.4	16,354
July	5,475	5,524	18.4	17,570
Aug.	3,299	4,717	19.9	15,737
Sept.	5,364	5,636	23.6	15,124
Oct.	6,675	5,915	26.5	14,965
Nov.	6,612	5,636	24.2	15,111
Dec.	5,686	4,272	23.7	16,354
July	12,049	10,317	20.6	14,108
Aug.	11,708	9,446	21.0	15,037
Sept.	10,435	7,862	22.0	15,869
Oct.	9,466	7,212	22.6	17,748
Nov.	9,063	6,335	21.7	19,170
Dec.	.....	.....	...	.....

* Stocks on hand at the end of month or year.
(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1931	1932	1933		1931	1932	1933
January	26,844	26,038	26,510	August	39,459	35,706	37,426
February ..	26,133	25,378	23,312	September .	36,670	33,828	34,303
March	31,037	29,597	28,227	October ...	35,051	32,680	32,973
April	33,400	31,234	30,176	November ..	30,640	29,895	30,262
May	35,716	32,016	33,999	December ..	30,529	27,110	.....
June	38,375	39,489	37,710				
July	39,459	30,929	34,458	Total	403,418	373,900	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1931																																
November	....	—	4½	4½	4⅝	4⅝	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	—	4½	4½	5	4⅝	—	4⅝
December	....	4⅝	4⅝	4⅝	4½	—	4⅝	4¾	4⅝	4⅝	4⅝	4⅝	—	4⅝	4⅝	—	4⅝	4⅝	5⅛	—	4⅝	—	4⅝	4⅝	—	—	—	5	5	5	—	4⅝
1932																																
January	....	—	—	4½	4½	4⅝	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	4⅝
February	....	4⅝	4⅝	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
March	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
April	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
May	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
June	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
July	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
August	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
September	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
October	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
November	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
December	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
1933																																
January	....	—	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
February	....	2½	2½	3	*	*	*	*	*	*	3	3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
March	....	2½	3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
April	....	4⅝	4½	4½	4½	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
May	....	6¾	6½	6½	6½	—	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝
June	....	6½	6½	6½	6½	—	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝
July	....	7⅛	7⅛	7⅛	7⅛	—	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
August	....	7⅝	7⅝	8	—	7⅝	7⅝	7⅝	7⅝	7⅝	7	7	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾
September	....	7¼	—	—	7⅜	8	8¼	—	9⅛	9	9	—	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾	8¾
October	....	7⅛	7⅛	7⅜	8	8¼	—	9⅛	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞	8⅞
November	....	7⅛	7⅛	8	8	—	9⅛	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
December	....	9¼	9¼	—	9	8⅛	9	9	9	—	8¾																					
1934																																
January	....	—	9	8⅛	9	9	9	—	8¾																							

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1927

Month	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	38.75	40.25	20.14	15.24	8.34	4.38	3.08
Feb.	38.25	32.75	23.97	15.85	7.70	4.03	2.95
Mar.	41.04	26.82	24.55	15.34	7.71	3.35	3.01
Apr.	40.86	18.97	21.18	14.93	6.43	3.02	3.56
May	40.76	18.99	21.46	14.24	6.49	3.09	4.95
June	37.25	19.59	20.64	12.45	6.35	2.66	6.15
July	34.87	19.40	21.30	11.24	6.37	2.89	8.01
Aug.	35.12	19.46	20.59	9.96	5.38	3.63	7.31
Sept.	33.67	18.47	20.37	8.28	5.08	3.84	7.30
Oct.	34.32	18.83	19.67	8.20	4.87	3.65	7.64
Nov.	37.58	18.26	16.62	9.01	4.65	3.44	8.66
Dec.	40.63	17.97	16.12	9.05	4.64	3.24	8.87
Average for Year	37.72	22.48	20.55	11.98	6.17	3.49	5.96

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1	—	3⅞	4⅛	—	17	3⅛	4⅛	—	
2	4⅛	3⅛	4⅛	4⅛	18	3⅛	4⅛	4⅛	
3	3⅛	3⅛	—	4¼	19	3⅛	—	4⅛	
4	4	4	4⅛	4⅛	20	3⅛	4⅛	4⅛	
5	3⅛	—	4¼	4¼	21	3⅛	4⅛	4⅛	
6	4	3⅛	4⅛	4⅛	22	—	4⅛	4⅛	
7	4	3⅛	4⅛	—	23	3⅛	4⅛	—	
8	—	3⅛	4⅛	4⅛	24	3⅛	4⅛	—	
9	3⅛	4⅛	4⅛		25	3⅛	4⅛	—	
10	4⅛	4⅛	—		26	3⅛	—	—	
11	4	—	4⅛		27	3⅛	4⅛	4¼	
12	—	—	4⅛		28	3⅛	4⅛	4⅛	
13	3⅛	4⅛	4⅛		29	—	4⅛	4⅛	
14	3⅛	4⅛	4⅛		30	3⅛	4⅛	—	
15	—	4⅛	4⅛		31	3⅛	—	—	
16	3⅛	4⅛	4⅛						

Average Monthly Price Per Pound

Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence	Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence
Jan.	7.471	4.160	3.052	2.264	Aug.	4.880	2.385	2.654	3.811
Feb.	7.948	3.823	2.760	2.093	Sept.	4.075	2.524	2.485	3.728
Mar.	7.595	3.822	2.047	2.099	Oct.	4.023	2.898	2.425	3.957
Apr.	7.391	3.082	1.876	2.323	Nov.	4.440	2.890	2.518	4.096
May	6.926	3.035	1.825	2.966	Dec.	4.516	3.115	2.444	4.200
June	6.195	3.082	1.750	3.392	Average for Year	5.926	3.155	2.434	3.233
July	5.648	3.048	1.875	3.860					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	Nov.	Dec.	Jan.	Date	Nov.	Dec.	Jan.	Date	Nov.	Dec.	Jan.
1	9.75	10.20	——	11	10.05	10.20		21	10.25	10.00	
2	9.75	10.15	10.50	12	——	10.15		22	10.15	10.25	
3	9.80	——	10.45	13	10.10	10.20		23	10.00	——	
4	9.75	10.05	10.65	14	10.25	10.15		24	10.10	——	
5	——	10.20	10.55	15	10.25	10.20		25	10.10	——	
6	9.55	10.15	10.75	16	10.40	10.10		26	——	10.15	
7	——	10.15	——	17	10.20	——		27	9.90	10.30	
8	9.90	10.10	10.85	18	10.15	10.05		28	10.05	10.35	
9	10.05	10.20		19	——	10.15		29	10.10	10.30	
10	10.05	——		20	10.25	10.05		30	——	——	
								31	——	——	

Average Monthly Price Per Pound

	1930 Cents	1931 Cents	1932 Cents	1933 Cents		1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	17.21	10.27	6.65	6.23	Aug.	12.03	7.21	7.43	9.55
Feb.	15.62	10.96	6.85	6.05	Sept.	10.85	6.52	6.30	9.64
Mar.	15.13	10.90	6.86	6.39	Oct.	10.63	6.32	6.30	9.58
Apr.	16.39	10.19	6.16	7.02	Nov.	10.96	6.44	6.22	10.04
May	16.43	9.38	5.72	8.64	Dec.	10.02	6.24	6.00	10.17
June	14.48	9.05	5.22	9.47	Average for Year	13.57	8.56	6.41	8.63
July	13.10	9.28	5.87	10.76					

*Exchanges closed due to Bank Moratorium.

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1931	1932	1933	AFLOAT 1931	1932	1933	ON HAND AND AFLOAT 1931	1932	1933
Jan.	209,487	322,860	396,376	56,187	42,234	32,539	265,674	365,094	428,915
Feb.	212,833	318,936	381,794	63,680	51,728	32,898	276,513	370,604	414,692
Mar.	217,804	329,586	398,135	63,133	44,190	29,531	280,937	373,776	419,666
Apr.	228,382	336,957	382,167	56,700	40,387	30,745	285,082	377,344	412,912
May	220,799	336,719	364,623	73,564	50,453	43,342	294,363	387,172	407,965
June	225,536	334,657	333,954	69,421	43,079	63,608	294,957	377,736	397,562
July	234,822	333,729	326,609	66,873	37,894	57,435	301,695	371,623	384,044
Aug.	240,816	342,888	325,148	61,469	42,846	53,084	302,285	385,734	378,232
Sept.	254,324	346,154	334,637	62,420	46,188	57,255	316,744	342,342	391,892
Oct.	273,456	358,282	343,579	68,427	40,176	58,568	341,883	398,458	402,147
Nov.	292,493	360,386	353,852	77,443	40,879	57,140	369,936	401,265	410,992
Dec.	322,826	379,000	.....	53,940	38,360	.....	376,766	417,360	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1931	1932	1933	At end of	1931	1932	1933
Jan.	81,093	67,166	36,481	July	81,317	48,842	41,178
Feb.	82,265	65,942	37,182	Aug.	81,560	47,079	39,480
Mar.	84,736	64,280	40,845	Sept.	79,692	44,942	39,237
Apr.	86,831	61,848	40,911	Oct.	76,778	42,327	37,101
May	86,683	56,089	41,998	Nov.	73,911	40,606	36,139
June	83,071	51,009	43,032	Dec.	69,470	37,407	.....

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1933					
May	41,478	41,695	41,843	41,969	
June	42,457	42,723	43,361	44,043	
July	43,748	43,310	42,745	42,046	41,161
August	41,211	40,544	40,166	39,237	
September	39,472	39,257	39,191	39,292	39,221
October	38,935	38,565	38,457	37,898	
November	37,170	36,831	36,443	36,360	
December	36,165	35,853	35,970	35,643	35,777

Stocks in Liverpool

1933				
May	55,148	56,139	57,117	56,795	
June	57,560	58,560	59,326	59,272	
July	59,560	59,372	59,135	59,901	58,864
August	58,540	58,391	58,050	57,508	
September	57,266	57,213	56,826	56,625	56,164
October	54,899	54,134	53,500	52,969	
November	52,818	52,910	52,466	52,418	
December	51,894	51,803	51,954	51,206	51,014

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1930	1931	1932	1933	End of	1930	1931	1932	1933
Jan.	39,727	48,802	48,850	22,525	July	45,459	51,203	17,017	36,972
Feb.	44,371	49,283	46,954	21,530	Aug.	48,132	48,971	20,649	38,601
Mar.	45,657	49,590	46,591	24,594	Sept.	44,015	47,025	20,415	36,948
Apr.	48,473	45,868	39,663	25,460	Oct.	39,930	52,132	23,158	37,282
May	44,715	44,278	38,690	29,822	Nov.	41,674	46,497	25,419	39,018
June	42,451	47,517	19,770	34,676	Dec.	45,963	45,795	25,341	.....

STOCKS IN OTHER CENTRES

End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
1933:					
Jan.	38,844	25,080	2,143	4,662	5,676
Feb.	37,323	28,540	2,033	4,210	6,006
Mar.	33,494	26,180	2,183	3,779	5,780
Apr.	33,391	27,710	2,214	3,428	5,204
May	32,613	24,090	1,534	3,177	4,790
June	35,919	22,930	1,147	2,913	4,321
July	35,020	22,900	1,007	3,208	3,830
Aug.	34,463	22,900	1,033	3,411	3,588
Sept.	33,751	22,000	1,107	4,286	3,288
Oct.	35,011	25,900	1,411	4,889	3,237
Nov.	34,758				3,383

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1924	21,863,311	19.7	1929	24,141,502	80.3
1925	26,001,664	66.8	1930	17,364,096	80.1
1926	24,199,524	78.8	1931	11,253,800	76.7
1927	19,700,003	79.1	1932	6,261,336	—
1928	24,247,282	81.6	1933	8,713,962	—
1933:			1933:		
January	727,308	79.1	July	900,227	—
February	579,789	—	August	960,795	—
March	346,755	—	September	701,302	—
April	898,318	—	October	522,829	—
May	933,083	—	November	506,165	—
June	1,015,181	—	December	627,210	—

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	60,845	61,237	64,439	77,944	68,726	50,965	48,739	40,085
Shipments	59,262	59,002	64,059	74,296	69,395	53,638	48,151	40,260
Inventory[2]	8,142	10,456	10,264	13,624	11,838	9,003	7,775	7,644

Figures for Recent Months

	PRODUCTION 1931	1932	1933	SHIPMENTS 1931	1932	1933	INVENTORY 1931	1932	1933
Jan.	3,675	3,462	2,258	3,744	3,253	2,597	8,957	7,912	7,237
Feb.	3,985	3,871	2,339	3,402	2,553	2,292	9,536	9,172	7,377
Mar.	4,663	3,671	2,038	4,122	2,954	2,092	10,014	9,878	7,290
Apr.	4,944	3,517	3,123	4,932	3,698	3,654	10,031	9,846	6,778
May	5,679	3,820	5,189	5,415	4,258	5,180	10,312	9,379	6,760
June	5,672	5,643	6,100	5,572	10,065	6,305	10,447	4,999	6,615
July	4,926	3,617	5,714	5,462	2,404	5,497	9,919	6,203	6,844
Aug.	3,906	3,089	4,994	4,960	2,655	4,707	8,896	6,659	7,070
Sept.	3,172	2,539	3,999	3,932	3,082	3,503	8,158	6,096	7,595
Oct.	2,974	2,569	3,429	2,852	1,799	2,537	8,300	6,876	8,462
Nov.	2,500	2,304	.....	2,887	1,711	.....	7,919	7,454	.....
Dec.	2,643	1,983	.....	2,781	1,819	.....	7,775	7,644	.....

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	82,614	76,618	70,823	80,180	68,829	52,420	48,333	36,801
Shipments	81,004	71,591	72,896	77,127	70,592	54,938	50,021	37,935
Inventory[2]	11,313	16,200	13,692	16,117	12,807	9,999	7,922	6,749

Figures for Recent Months

	PRODUCTION 1931	1932	1933	SHIPMENTS 1931	1932	1933	INVENTORY 1931	1932	1933
Jan.	3,623	3,308	2,093	4,062	3,520	2,535	9,439	7,719	6,197
Feb.	3,916	3,281	2,224	3,400	2,728	2,102	9,921	8,760	6,357
Mar.	4,450	3,502	1,883	3,789	2,686	1,902	10,475	9,448	6,369
Apr.	4,617	3,225	2,853	4,636	3,385	3,051	10,413	9,441	6,189
May	5,413	3,409	4,700	5,281	3,867	4,463	10,459	8,913	6,382
June	5,358	5,279	5,448	5,397	9,019	5,778	10,504	5,174	6,097
July	4,955	2,937	5,603	5,831	2,160	5,211	9,589	5,975	6,440
Aug.	4,435	2,748	4,916	5,301	2,503	4,687	8,774	6,127	6,628
Sept.	3,449	2,601	3,827	4,150	3,098	3,472	8,095	5,753	7,008
Oct.	3,077	2,187	3,506	2,813	1,658	2,676	8,321	6,214	7,831
Nov.	2,443	2,005	.....	2,594	1,578	.....	8,119	6,662	.....
Dec.	2,597	1,779	.....	2,767	1,724	.....	7,922	6,749	.....

(1) **Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.**

(2) **Held by manufacturers at end of period indicated.**

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
Aug.	90,325	75,907	14,418	4,067	3,166	901	94,391
Sept.	84,150	64,748	19,402	2,342	1,741	601	86,483
Oct.	48,702	35,107	13,595	2,923	2,361	562	51,857
Nov.	59,557	47,532	12,025	2,204	1,669	535	61,760
Dec.	107,353	86,149	21,204	2,139	1,561	578	109,542
Total	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933							
Jan.	130,044	108,326	21,718	3,358	2,921	437	133,402
Feb.	106,825	91,492	15,333	3,298	3,025	273	110,123
Mar.	117,949	99,885	18,064	6,632	5,927	705	124,581
Apr.	180,667	153,350	27,317	8,255	6,957	1,298	189,922
May	218,303	184,698	33,605	9,396	8,024	1,372	227,669
June	253,322	211,483	41,839	7,323	6,005	1,318	260,645
July	233,088	195,023	38,065	6,540	5,322	1,218	239,628
Aug.	236,487	195,144	41,343	6,079	4,919	1,160	242,566
Sept.	196,082	160,900	35,182	5,808	4,358	1,450	201,990
Oct.	138,485	108,073	30,412	3,682	2,723	959	142,167
Nov.	63,904	44,429	19,475	2,291	1,503	786	66,195

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]				DUTCH EAST INDIES[2]										
	Gross Exports	Gross Exports Minus Imports		Ceylon[3]	India & Burma[4]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[4]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
May	40,297	5,677	34,620	3,824	304	595	344	118	6,552	6,551	6,012	964	416	278	60,578
June	36,566	5,665	30,901	3,444	359	481	345	166	5,610	7,516	5,507	1,218	394	139	56,080
July	40,723	5,346	35,377	3,501	99	442	400	184	5,779	6,257	6,145	1,233	232	141	59,790
Aug.	39,327	7,371	31,956	4,717	129	506	400	300	4,803	4,882	7,244	1,088	303	49	56,377
Sept.	41,973	8,869	33,104	5,238	122	614	400	340	3,858	6,485	7,664	1,621	318	78	59,733
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	809	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,801	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,602	318	590	458	305	4,766	5,630	6,840	1,957	554	125*	58,887
Feb.	37,564	6,167	31,397	5,064	304	541	458	368	4,895	5,119	6,081	895	620	125*	55,867
Mar.	42,059	7,964	34,095	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	125*	61,501
Apr.	36,752	7,758	28,994	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	125*	56,435
May	42,902	13,664	29,238	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	125	66,078
June	41,411	16,538	24,873	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	125*	63,794
July	50,531	18,772	31,759	4,201	270	1,358	600*	797	7,367	8,580	16,534	1,310	913	125*	73,814
Aug.	52,266	17,869	34,397	5,839	246	955	600*	926	6,460	7,985	15,161	808	1,116	125*	74,618
Sept.	49,607	15,146	34,461	5,111	125	1,027	600*	611	5,868	9,164	15,005	1,702	656	125*	74,455
Oct.	61,002	17,390	43,612	5,674	271	959	600*	979	6,329	8,682	15,170	1,513	965	125*	84,879
Nov.	54,599	20,142	34,457	6,363		1,020	600*	1,191	6,684	9,951	14,474	1,599	956	125*	
Dec.	57,579	18,110	39,469												

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,809
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,483	16,184	8,480	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,098	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1932:															
Apr.	36,326	6,826	2,956	3,737	1,600	3,684	1,083	764	1,549	847	348	474	417	1,259	61,870
May	32,818	1,110	2,277	3,447	1,416	3,917	1,033	3,743	2,048	617	286	707	272	350	51,821
June	39,136	1,853	3,666	3,405	2,834	2,834	1,534	5,291	1,421	449	127	578	196	280	63,604
July	30,494	4,082	3,125	3,380	1,529	2,544	1,116	1,735	624	723	—214	784	258	1,207	51,387
Aug.	32,650	6,671	4,919	4,006	970	3,390	1,615	1,740	751	1,211	—66	611	210	557	59,235
Sept.	26,865	3,942	5,845	3,674	2,770	5,878	971	1,376	625	694	103	534	267	406	54,220
Oct.	34,748	2,927	4,715	4,177	1,207	5,653	510	1,853	569	627	553	537	489	986	59,551
Nov.	27,689	4,950	3,830	3,577	1,593	4,563	1,265	1,481	1,653	1,035	275	489	631	650	53,681
Dec.	31,246	1,182	3,205	4,623	941	5,603	2,103	3,720	745	1,298	348	544	485	2,602	57,645
1933:															
Jan.	29,260	3,277	5,858	4,241	1,189	7,611	3,005	1,558	1,275	1,388	308	640	252	838	60,700
Feb	22,970	7,102	6,603	4,460	1,175	8,508	994	2,820	2,001	1,670	375	564	132	681	60,055
Mar.	27,348	8,883	6,093	4,425	1,114	6,035	1,604	2,088	1,904	952	282	649	340	688	62,405
Apr.	20,236	7,765	6,308	4,805	555	5,495	2,215	2,274	1,580	882	163	606	281	400	53,565
May	24,894	11,085	4,144	4,622	1,704	5,289	1,278	1,691	425	710	—525	536	433	432	56,718
June	22,228	8,739	4,056	3,639	1,441	3,330	1,997	2,000	613	469	—519	772	541	400	49,706
July	43,824	3,961	3,774	4,103	1,192	1,460	1,146	2,952	2,347	299	16	486	435	287	66,282
Aug.	43,208	4,330	5,251	4,193	1,795	4,426	1,249	3,312	1,500	325	209	616	606	2,759	73,779
Sept.	43,886	4,341	4,111	5,841	2,620	5,371	2,055	2,168	794	864	189	604	790	577	74,211
Oct.	43,366	3,373	4,921	4,772	2,580	6,212	1,836	2,085	604	1,118	310	777	441	686	73,081
Nov.	39,633	3,955									222				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemicals and Compounding Materials —

ACCELERATORS—
Ureka C—Ureka Blend B—Ureka.—A-1, A-7, A-11, A-16, A-19, A-32, Z-88, A-510, DPG
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